Coville Journal
1896-97 1902

July 5, 1896, en route Chic. North-Western and Union Pacific

Aneroid readings

Near Ames, Iowa { Leather 960 / Green 600 } 9:10 A.M.

Near Carroll, Iowa { Leather 1300 / Green 1000 } 12:00 noon.

Council Bluffs, Iowa { Leather 1050 / Green 700 } 2:30 P.M.

July 6, en route Union Pacific.

Granite Canon 8.30 A.M.

Aneroids { Leather 7200 / Green 7200 } Railway guide 7310.

On rock outcroppings occur the ~~first~~ shrubs, seen also sparingly a few miles back. Collected the following, perhaps all that occur.

Ribes
Opulaster
Cercocarpus parvifolius.

Beyond Granite Canon the first cedars (Juniperus) are seen, accompanied within five miles by a few pines (Pinus). All these on the rock outcroppings, with open plains vegetation on the smooth ground.

Sherman (Pass) 9:00 A.M.

Aneroids { Leather 6000 / Green 8050 } Railway guide 8247.

Before reaching Sherman and after passing it the pine trees were frequent on the outcrops and in sheltered ravines the aspen (Populus tremuloides) was apparently seen.

July 6, 1896 (con.).

Descending 350 feet in the next valley (about Tie Siding) the pines and cedars disappear, the outcrops bearing only shrubs, chiefly the Ribes. A low Artemisia is abundant. Farther down (950 ft.) at Red Buttes there is nothing but the plains vegetation

Between Laramie and Wyoming (7149 and ~~6804~~ 7077 ft.) were first seen

Artemisia cana (loose soil)

Sarcobatus vermiculatus (low ground)

At Rock Creek (6704 ft.) and for several miles east, the valley in which the railroad runs is alkaline with a rolling loose sandy or gravelly soil and these two shrubs are abundant, the latter in the lower grounds chiefly.

West of Rock Creek the sage brush little by little covers the hills, and consists chiefly of another species, Artemisia

Artemisia cana prefers a somewhat moister situation than the other.

Rawlins, Wyoming. 3:00 P.M.

Aneroids Leather 6826 } Railway guide 6744.
Green 6825 }

July 6, 1896 (con.)

From Rawlins to Tipton (6744 to 6997 ft.) chiefly over a plateau and the soil very clayey the Artemisias and Sarcobatus give way to broad, gently sloping stretches of Atriplex nuttallii. This forms little mats seldom exceeding half a meter in diameter and, except when flowering, usually not rising more than 10 cm. above the ground. The separate mats are often contiguous or nearly so over the whole surface. In these broad stretches the Artemisias and Sarcobatus occupy disturbed ground only, often a shallow surface cracks where water from a heavy rain has cut a channel from the foot of a hill toward the level valley bottom, or again the small circular area of a buffalo wallow.

Ontario, Oregon, July 7, 1896. 5:00 oclock P.M.

Aneroids {Leather 2550 / Green 2350} Railway guide. 2157
Temperature by a local thermometer 106°.

From Shoshone to this point is one almost continuous covering of sage-brush, apparently all or nearly all of it Artemisia tridentata. The soil is very productive when irrigated. On the uplands are frequent ledges and other outcrops of lava, from which the soil appears to have been dirived. In some of the bottoms Sarcobatus vermiculatus occurs in abundance, but most of the soil is not alkaline.

Red butte, sunset, and rainbow at Green River.

Undershot wheels for irrigating along the snake.

Left Ontario by stage for Harney about 6 o'clock P.M.

In the valley bottom of the Snake River at Ontario occur

Sarcobatus vermiculatus, abundant in alk- [Saline soil]
Distichlis spicata, abundant in alkaline soil

July 7, 1876 (con)

Artemisia tridentata, abundant except on alka-
Line fail
Grayia spinosa, sparing in sage brush.

Water is ditched 20 miles from the Owyhee and 12 miles from the Malheur to irrigate the plains west of Ontario. About one-half the cultivated crops ~~is~~ devoted to alfalfa. The shade trees about the ranch houses are chiefly Lombardy poplar. Mosquitos are abundant. Woven corrals of willow are common

About 7 miles out from Ontario in an alkaline spot was seen

Atriplex confertifolia?

Kochia americana.

Aneroid readings at the first crossing of the Malheur were leather 2600, green 2400.

Artemisia tridentata shrubs were seen here 6 ft, 6 in high. Great piles of it were seen in door-yards, for use as fuel.

Aneroid readings 1¼ miles west of Vale at 10:30 P.M. (Mt. time) — leather 2650 ft, green 2450 ft.

En route, stage from Ontario to Harney, July 8, 1896.

Altitude readings at head of Cottonwood Canyon, between Vale and Westfall, 4 o'clock A.M. mountain time — leather 3500 ft, ~~bea~~ green 2450 ft.

Philadelphus lewisii was in flower in the canyon. Several other shrubs were in the canyon, but were not distinguished in the darkness.

Aneroid readings at summit of the divide between Cottonwood Canyon and Westfall, at 5 o'clock A.M. mountain time — leather 3775 ft, green 3700 ft.

A lilac-flowerd Calochortus was here seen for the first time in the sage brush.

Aneroid readings at Westfall 7 A.M. mountain time — leather 3300 ft, green 3150 ft.

Mr. S. L. Payne, postmaster at Westfall desires the names of plants on which his bees work for honey. Better send him some next season.

In the canyon just west of Westfall occur the following:

Prunus demissa
Philadelphus lewisii
Rhus diversiloba
Clematis ligusticifolia
Grayia spinosa
Ribes aureum, with salmon-colored fruit.

A meadow in the upper part of this canyon, in its natural state consisted of about 150 acres of "rye grass" (Elymus). This makes a "strong" hay, "better than alfalfa for dibing"! It stands about 5 to 8 feet high, and cuts 1½ to 3 tons per acre.

At Beckers Reservoir occured
Peraphyllum ramosissimum
Juniperus single trees.
Artemisia "tridentata"
Kunzia tridentata. "Buckbrush"
Aneroid readings here at 8:45 A.M. mountain time — heather 3600, green 3000.

The Kunzia is said to be fed by deer and antelope in winter.

Ribes "cerro-glabrum", "grouse bush" occurs on rocky soil. Fruit insipid

Juniper makes the best fire-wood in the country; beats sage,

pine, or fir. Charred for fence posts lasts a "life-time".

Aneroid readings on divide ½ mile below Mrs. Prieto's – leather 7025 green 3950

Many junipers occur at this altitude.

Aneroid readings at Mr. Prieto's (Prieto station) – leather 3925, green 3850.

Monolepis chenopodioides was being gathered by a boy here to feed to the pigs fresh.

Artemisia "lingulata" abundant on the divide mentioned above.

About 100 feet above Mrs. Prieto's many junipers occur again.

Aneroid – readings at Bendire Summit – both 4900 ft.

On the east side of this divide, apparently where snow had drifted heavily occurred.

Prunus tremuloides, large thickets
Ceanothus velutinus
Symphoricarpus
Lilia aggregata
Amelanchier alnifolia

Prunus demissa.
Prunus emarginata.
Besides Perasphyllum, Kunzia, and Ribes "cerro-glabrum" which also occur much lower down.
Aneroid readings at Bendire Spring – leather 4150, green 4100 at 1[5] P.M.
Aneroid readings at Beulah in Agency Valley 3:15 P.M. – leather 3700, green 3650.
The vegetation in the valley is Artemisia tridentata without the Kunzia etc.
In canyon on way up to first divide between Agency Valley and Otis Creek:

Ribes aureum
Ribes "cerro-glabrum"
Perasphyllum
Amelanchier alnifolia
Kunzia tridentata, at summit of divide

Aneroid readings on first divide – leather 4250, green 4200 5:16 P.M.
On nearly pure bottom of clayey soil between the divides a nearly pure growth of Artemisia "lingulata"

Aneroid readings on second divide — 7400 ft on both — 6:00 P. M.

Occasional juniper here with the other accompanying shrubs, Kunzia and Peraphyllum. Also stretches of Artemisia "lingulata".

Aneroid-readings on Otis Creek bottom — leather 3500, green 3720, at 7:15 P. M.

About 50 trees of Pinus ponderosa scopulorum, some young, on a chalky west slope, rising from bottom to perhaps 200 feet higher.

About 1000 acres of Elymus on Otis Creek. Also a little Sarcobatus.

Harney, Oregon, July 9, 1896.

Aneroid readings

Leather 4400.

Green 4375.

The crops cultivated in the Harney Valley are commonly oats, wheat, rye, barley, potatoes, and such garden vegetables as lettuce, beets, peas, cabbages, radishes. Watermelons, muskmelons, and cucumbers are usually unsuccessful on account of late and early frosts. Among fruits, hardy apples, plums, raspberries, and strawberries have been successfully cultivated, but peaches are not a success. Most of the fruits used in the Harney valley region are brought in from the John Day valley, about 75 miles northward, in the Blue Mountains.

Late in the afternoon started from Harney for Bailey's camp in the Blue Mountains near the mines on Trout Creek about 12 miles north of Harney.

Aneroid readings at Gilbert's ranch.

Leather 4460

Green 4450

At this ranch were under cultivation cabbage, radishes, peas, beets, and potatoes.

Tomatoes can seldom be grown successfully. The lettuce was dying up, the radishes in good condition, the peas nearly ready to pick. Mr. Gilbert had water cress under cultivation (from seed) in his spring, a very uncommon plant in the region. A grove of Populus tremuloides at one edge of his ranch. Juncus longistylis and Limosella aquatica seen among other vegetation in a natural meadow along the creek.

Balsamorhiza sagittata eagerly cropped by saddle horses — horses are very fond of it.

At 700 feet above Harney Juniperus and Kunzia tridentata common.

Amelanchier alnifolia, "service berry" often eaten from the saddle, not served on the table.

Artemisia (tridentata) occupied to the exclusion of these shrubs a large area on a stony plateau.

At 800 feet above Harney, Ceanothus velutinus "snow bush", standing thick when the snow drifts in winter. Also Prunus emarginata and Prunus demissa.

At 0450 Cercocarpus ledifolius "mahog-

any"; an excellent firewood, which in a closed stove will burn 5 or 6 hours, but not much used by campers and miners, who want a quick fire and use sagebrush or juniper. Pinus ponderosa begins at this altitude.

At 5950 Abies concolor scattered among the pines and some Pseudotsuga taxifolia.

Bailey's camp at an altitude of

Leather 5950 ft.

Green 6000 ft.

Camp on Trout Creek, Blue Mountains, 12 miles north of Harney, July 10, 1896.

Thermometer 110° F. at 6:00 A.M.

Aneroid readings

Leather 5975 feet

Green 6025 feet.

Around Bailey's camp among the scattered yellow pines Pinus ponderosa, are

Berberis aquifolium, abundant.

Kunzia tridentata, abundant.

Artemisia tridentata, sparing.

Rosa

Symphoricarpus

Amelanchier alnifolia, 10 ft high, trunks 3 in. in diameter, growing in clumps like willow bushes.

Ribes (cerro-glabrum), 3 to 5 feet high.

Gilia (scarlet) 3 ft high.

Paeonia brownii

Geranium

Cercocarpus ledifolius

Sidalcea

Prunus demissa

Prunus emarginata.

Aneroid readings at camp as above 7:30 A.M.

Leather 5950 ft

Green 6000 ft.

At Kings Mill about 1 mile from one of the roads toward Harney, aneroid readings

Leather 6025 ft.

Green 6075 ft.

Pteryxia andromeda seen near here.

Lower limit of Pinus ponderosa and Cercocarpus ledifolius 5200 ft. Bigelovia (cana) and Tetradymia canescens common at same altitude.

Aneroid readings at Harney 11:30 A.M.

Leather 4375

Green 4300

Aneroid readings at Gilbets ranch

Leather 4500 ft.

Aneroid readings at Bailey's camp.

Leather 6000

Green 6150

July 11, 1896.

Set out from Bailey's camp as noted in yesterday's heading for Strawberry Butte about 50 miles northward in the Blue Mountains.

Aneroid readings at Baileys Camp

Leather 6050

Green 6150

Temperatures.

Maximum of preceding day 34° C.

Minimum of preading night 11 C

Bottom of Silvies Valley 4800 ft.

Pinus ponderosa coming down to valley bottom in only a few sheltered situations and there scattered. Juniper rarely seen.

Artemisia tridentata everywhere.

Kunzia tridentata occasional down to the valley bottom, but common higher.

Artemisia (cannides) on low alkaline flats.

Artemisia arbuscula abundant in spots.

Grayia spinosa seen only once.

Divide north of Silvies Valley on road to Canyon City 5600.

Antelope Meadow, altitude 5150 ft.

Camp in canyon of Antelope Creek, with Pinus murrayana and Larix occidentalis at 5100 ft.

July 12, 1896.

Aneroid readings at last nights camp.
Leather 5050 ft.
Green 5150 ft. } 6 A.M. Minimum 10°C.
Temperature 11° C

Proceeded on our way directly toward Strawberry Butte through valleys and over ridges. Pinus murrayana seen in abundance everywhere in the forests of Pinus ponderosa from 6000 to 7000 feet.

Larix occidentalis seen on north slope at 5700 feet in Pinus murrayana.

Picea engelmanni collected at 6400 ft.

Pseudotsuga taxifolia abundant at 6000 & 7000 ft.

Abies concolor, frequent at same altitudes

Camped at night about two miles southeast of Strawberry Butte, aneroid readings
Leather 7600 ft.
Green 7100 ft.

At 8000 ft on a divide above camp
Pinus albicaulis
Abies subalpina.

No Pinus ponderosa at ~~that~~ altitude of camp, but
Pinus murrayana.
Pseudotsuga taxifolia.?
Picea engelmanni.

July 13, 1896.

Camp about 2 miles southeast of Strawberry Butte, Blue Mountains, Oregon.

Aneroid readings 5:30 A.M.

Leather 7000 Minimum temperature 5.5° C.

Green 7050

Made a trip eastward up the slope opposite camp, and found the following plants:

At nearly altitude of camp.

Saxifraga punctata, in face, just beginning to flow.

Ribes (No.

Valeriana in flower.

Heracleum not yet in flower.

Pyrola secunda

Vaccinium microphyllum.

Arnica probably same as No.

Collinsia in fl.

Polemonium (fetidum) fl.

Aquilegia fl.

Pachystima myrsinites fl.

Epilobium spicatum not yet in bud.

Fragaria

Ribes viscosissimum.

Viola stemless, long-spurred.

Ribes cereum

Thalictrum (dioecious, green fl.)

Claytonia broad-leaved.

Habenaria white-fl.

Epilobium small.
Alnus , in clumps along wate courses.
Pedicularis ± No.
Lappula fl.
Galium biflorum fl.
Nemophila No.
Macrocalyx No.
Hydrophyllum fl.
Streptopus amplexicaulis fl.
Aconitum in bud.

At 7100 ft.
Artemisia tridentata, sparing
Potentilla with bright green leaves fl.
Hieracium bud.
Symphoricarpus bud.
Ceanothus velutinus
Viola (venulosa) same as No.
Gayophytum
Paeonia brooniii old fl.
Actaea fr.
Eriogonum bud
Ranunculus (septentrionaloides) fl.
Lonicera involucrata fl.
Prunus emarginata fl.
Amelanchier alnifolia fl.
Sorbus (not occidentalis) fl.
Castilleja yellow-bracted fl.

Populus tremuloides
Philop same as No.
At 7500 ft.
Amnia same as No.
Abies lasiocarpa, abundant.
At 7600 ft.
Pinus albicaulis, first tree seen, but many more within a hundred feet.
At 7700 ft.
Bikukulla No.
Ribes lacustre moderate fl.
At 7900 ft
Sambucus microcarpa No.
At 8000 ft, summit of divide.
Tropimon fl.
Spraguea No.
Linum lewisii fl.
Then turned northward along ridge toward Strawberry Butte. Readings hereafter with Green aneroid.
At 8200 ft.
Heuchera No.
Pentstemon No.
Juniperus No.
At 8250 ft.
Several plants, as collected.
On the south slope of Strawberry Butte

timber ceased with Pinus albicaulis at 8750 on a steep rocky slope.

At 8900 two 3-foot specimens of Pinus albicaulis occurred

Summit of Butte at 9100 ft. One specimen of Pinus albicaulis a few feet high within fifty feet of the summit on the southwest slope.

Many plants, as catalogued, found between timber-line and summit of Butte.

At the summit were seen

Sedum	same as No.
Phlox	" " "
Eriogonum	" " "
Pentstemon	" " "
Erigeron (pumatifidus)	" " "
Heuchera	" " "
Potentilla	" " "
Silene	(only in bud)

And two grasses, not in flower.

Returned to camp in afternoon.

Snow drifts in places 10 to 12 feet deep.

Peak very rocky, not clearly evident as having a true timber line.

July 4, 1896.

Camp as before near Strawberry Butte.
Aneroid readings 6:10 A.M.
Leather 7000 Temperature Minimum 10° C.
Green 7075 Maximum for yesterday 21° C.

Set out from camp on back trail toward ~~Harney~~, soon striking into the valley of Bear Creek, which we descended several miles.

Pinus ponderosa on suitable slopes coming up to 7000 ft or a little higher.

Larix occidentalis abundant on the steep north slope of Bear Creek, where the valley bottom ranges from 5400 to 5200 feet. Large trees in bottom reaching 3 or 4 feet in diameter.

Camped in Antelope Meadow, by some mud springs.

July 15, 1896.

Aneroid readings at camp in Antelope Meadow
Leather 5150 ft. Temperature, minimum 10°C.
Grass 5200 ft.

Last night a heavy dew fell beginning almost immediately after sunset. This morning after three hours of bright sunlight, the grass was still wet.

Continued on our return to the camp in Trout Creek.

Aneroid reading, bottom of Silvies Valley, 4800 ft.
Lower limit of Pinus ponderosa at south end of Silvies Valley 4800 ft.
Reached Trout Creek camp about 6 P. M..

Took 10 or 15 sage brush & sarcobatus pictures.
Came down again into the plain of Blitzen river, reading 4050 ft. Same shrubby vegetation as recorded near the narrows.
Along the marshes Suaeda maritima.
Lunched at a house on Pete French's great ranch, reading 4130 ft.
In the drainage ditch that flowed by the house (draining the marshes) were found
Callitriche
Lemna polyrhiza
Lemna trisulca
Lemna valdiviana
Ceratophyllum demersum
Utricularia vulgaris
Potamogeton natans
Batrachium
Sparganium
Alisma
Cicuta
Scirpus fluviatilis occidentalis
Udora canadensis
Potamogeton pauciflorus
Myriophyllum
Riccia natans
Typha latifolia
On the west side of the Blitzen about

he does not usually run it to its full capacity. His market is ~~it~~ wholly a local one, Harney, Burns, and the P. L. S. Company (Pacific Live Stock Comany).

July 17, 1896.

Harney, Oregon.

Remained at camp and in Harney to-day.
Minimum temperature 10.5° C.

Camp at old Harney post. July 15, 1896.
Temperature, minimum, 10.5°C.

Cumberland stone coal, for the use of blacksmiths is worth sixty dollars a ton at Harney. The blacksmiths substitute for it charcoal, usually from Pinus ponderosa, which sells for 20¢ per bushel, a bushel weighing 13 pounds. About 200 bushels are estimated to be equivalent to a ton of Cumberland coal. Cercocarpus ledifolius makes a better charcoal, though it is not so much used. It weighs 40 pounds to the bushel and sells for 30¢.

Aneroid readings 12:45, noon.
Leather 4550 ft. Temperature 27° C.
Green 4580 ft.

Thermometers at 1:20 P.M. exposed on a fine board to direct rays of sun
Alcohol 45.5° C
Mercury 49.5° C.

Climbed to the top of the plateau east of camp, altitude 4950 ft. On the slope occurred, not found at base,
Amelanchier alnifolia,
Kunzia tridentata,
Ribes (cereo-glabrum)

Prunus demissa

More grass and less Artemisia toward the top of the slope.

On top of plateau, above the igneous "rim rock", the shrubs mentioned did not occur, but some Artemisia tridentata and a great deal of Artemisia arbuscula, the soil there very shallow and stony.

The Ribes is in full fruit, the bright red to orange, smooth, translucent berries having a soft mucilaginous pulp, but almost no taste. Mr. Bailey states that they are eaten a great deal by

The mature fruits of Kunzia resemble large dry achenia, but the indehiscent dry husk of the mature carpel contains a clavate-obovate, purple seed the ~~outer~~ covering of which contains a purple very astringent juice, an undoubted protection of the soft seed against the depredations of small animals.

Mercury thermometer on brown lava rock covered with black lichens 49° C. 2:00 P.M.

July 19, 1896.

Camp at old military post near Harney, Oregon.

Temperature at 4:30 A.M. 12° C.

Went up to the "rim rock" east of camp again to-day.

Grayia spinosa abundant around the base of the rim rock, and in full fruit. Fruit easily detached when shaken, resembling a samara.

Plants illustrating distibution of seeds.

Astragalus No. 594, pods erect open at apex.

Astragalus No. 591, pods pendent, open at base.

Astragalus No. 593, pods semicircular, open at both base and apex.

Camassia , pods erect, open at apex.

Crepis acuminata, achenia not detached until shaken.

Balsamorhiza (serrata), achenia easily shaken out from the persistent bracts of the head.

The fruit of Ribes aureum varying in color from yellow to orange and black is often picked and stewed in sugar or made into pies. It much resembles the common cultivated currant, but is not so sour and does not require so much sugar.

The great industry of this part of Oregon is the raising of cattle and sheep. The main natural resources of the country, which have created this industry are the endless grazing areas of the upland country, extending from the valley bottoms through the sage brush up to and into the yellow pine forests of the mountains and the great natural meadows of the valley bottoms which furnish all the hay needed for winter feeding. Most of the live stock product of the Harney Valley is marketed at Huntington, and the manufactured goods used in the region are largely freighted in to Burns and Harney from that point. The cattle are driven to Huntington when fat and then shipped by rail. The sheep when intended for live shipping are treated similarly. When raised for their wool they are usually sheared in the vicinity in which they are raised and the wool freighted at a cost of about 1 cent per pound to Huntington. The same rate holds between Heppner and Pendleton.

July 20, 1896.

Camp as yesterday
Aneroids changed by screw to 4050 ft set at 30 inches 0.
Minimum 11° C.
Left ~~Ha~~rney at noon for Stein's Mountain, by way of the Narrows, which we reached at about 7 P.M.
The sink of Rattlesnake Creek is a natural meadow two or three miles in diameter lying directly south of Harney. It is used as a source of hay, containing
Redtop
Sugar-grass
Foxtail, Hordeum
Bluejoint, Agropyrum
Wire grass, Juncus balticus.
Cane grass,
Salt grass, Distichlis spicata.
Rye grass, Elymus
In the alkaline bottoms about the marsh are
Sarcobatus
Iva axillaris
Distichlis spicata
Nitrophila occidentalis

Juncus balticus
Gutierrezia
Bigelovia
Artemisia tridentata
Kochia americana.
Artemisia (canoides)
Thelypodium pubescens, entire.
Elymus condensatus

This country, and particularly the Island elevation of from 2 to 5 ft between the various channels of Silvis River, has been fenced and county roads built for only about 2 years.

In the "sloughs" (slews) about the island are marshes of, chiefly,

Scirpus lacustris occidentalis, tule.
Sparganium, very large.

containing also

Batrachium
Alisma
Utricularia
Bolelia
Potamogeton

Between the "island" and the Narrows the land is low, and most of it flooded in spring. This flooded land bears an almost exclusive growth of foxtail Hordeum, resembling vast fields

of barley hundreds or thousands of acres in extent, 1 or 2 X 5 or 6 often seen at once. The higher ground not flooded bears a smooth lawn of salt grass Distichlis, scores of acres in extent. Above this Sarcobatus and a little Artemisia tridentata. Soil often sandy.

Hundreds of cattle and horses grazing, the horses selecting the foxtail usually, and the cattle the salt grass. Salt grass in seed very nutritious for fall pasturage. Foxtail with fall growth from the root, and heads gone, excellent pasturage for horses, indeed the best in the marshes.

In March, 1890 after an almost rainless spring and summer in 1889, and consequent lack of hay about 75-% , according to Jasper Davis of the cattle in the whole Harney County region died of starvation. Mr. Rieke at P Ranch estimates the average loss at 50%, that at the P Ranch, where facilities for carrying them were of the best, was 30%. At some ranches it ran as high as 70% and even 90%.

Narrows fuel, juniper brought from Dog Mountain about 5 miles northwest. It (the juniper) runs west 15 or 20 miles to Sage Hen Creek.

Harney Lake higher than Malheur, and separated by ridge of sand dunes— broke through a year ago.

Such a famine once in about 7 to 10 years, fide Rieke.

July 21, 1896.

Left ~~the Narrows at 7 A.M. Harney at noon to-day~~ for Andrews on the west side of Stein's Mountain.

Minimum temperature at Narrows 52°F.

Leather 4060 ft.

Green 4060 ft.

Took the road for P Ranch (Pete French).

The succession of vegetation from the marsh here is

First Scirpus lacustris occidentalis, tule

Second Juncus balticus, rush grass.

Third Hordeum, foxtail

Fourth, Distichlis spicata, salt grass.

Fifth, Sarcobatus vermiculatus, greasewood,
Atriplex confertifolia
Artemisia tridentata
Grayia spinosa
Tetradymia spinosa
Artemisia spinescens
Bigelovia (smooth, fasciculata)
Obione canescens

In climbing the divide up the Blitzen river Tetradymia (striata) appears, and on the divide, at 4280 feet, the shrubby vegetation is Artemisia tridentata 9/10
Tetradymia (striata)
Bigelovia (as above)
Grayia spinosa
} for miles.

~~Forks~~

July 16, 1896.

Aneroid readings at Trout Creek camp.
Leather 6075 Minimum 13.5° C.
Green 6250

Came down to Harney, and went into camp at a ranch on the south end of the old government prost, now wholly removed. Aneroid ~~7~~ 6

Met Mr. King, the proprietor of King's mill. He saws mostly pine (Pinus ponderosa) making house-building lumber, shingles, boards, joists, fence materials, etc. "Red fir" (Pseudotsuga mucronata) the best hardwood timber of the region, used for wagon tongues, bolsters, rraches, etc. "White fir" (Abies concolor) ~~seargely~~ used for lumber or any other purpose, even for firewood. "Mountain mahogany" (Cercocarpus ledifolius) often used in repairing machinery, for example boxes for shafting and sled runners. Mr. King has used a box of this will on a large wheel shaft and considers it superior to Babbitt metal when saturated with oil. He has also known it to be used as a pitman box on a mowing machine. Mr. Kings mill has a capacity of 50000 feet a day, though

15 miles south of the Narrows, junipers
begin to appear on the hills coming
down in the shape of a few scattered
trees practically to the valley bottom
a few miles farther south. The western
hills of the Blitzen continue to bear
junipers all the way to Steins Mountain.
In one place 100 feet above the marsh
a juniper tree was seen, with
Amelanchier alnifolia
Prunus demissa
Ribes cerro-glabrum.
Camped at the P Ranch.

July 22, 1896.

P Ranch, weston base of Steins Mountain.

Took a horseback ride with F. S. Rieder. twelve miles into the Mountain to the "fir grove".

Aneroid at P Ranch 4710.

First vegetation above the valley

Artemisia tridentata

Grayia spinosa

Tetradymia glabrata, with occasional broad stretches of Artemisia arbuscula.

At 5250 feet came in

Symphoricarpos

Amelanchier.

Tetradymia canescens

Balsamorhiza sagittata.

At 5400 feet came in

Kunzia tridentata

Spiraea dumosa no

Ribes (cereo-glabrum)

A Delphinium, was pointed out to me under the name "larkspur" as killing probably 1% of the stock each ~~year~~ spring on the average

One of the species of Phlox, and probably more than one, similar to P. douglasii is greedily eaten by stock in

the spring, and fattens them rapidly.

At 5500 appears Prunus (emarginatoides), with many groves of Populus tremuloides "quaking asp" on north slopes

At 5600 appeared

Ceanothus velutinus
Cercocarpus ledifolius (used for hay derricks etc.)
Prunus demissa
Eriogonum (pinetorum)
Lupinus (spicatus)

At 5960

Berberis aquifolium

Lunched in a gully with a cool stream at 5900 feet. Here were found among the aspens.

Aconitum
Shepherdia
Fontinalis
Aquilegia
Gilia nuttallii

The "fir grove" is a scattered growth of Abies concolor, some of the trees three feet in diameter, occupying a steep north slope with Cercocarpus, Populus and Ceanothus at 5900 to 6250 feet altitude. It is used at the ranch for log house timbers and other similar purposes, for which juniper logs are too short and knotty.

Along the stream at the bottom of the creek grew

Ribes (foetidum)
Veratrum
Lonicera involucrata
Ribes No.
Actaea arguta
Geum macrophyllum

At 6300 feet, 50 feet below the highest point reached, were taken two pictures of Cercocarpus ledifolius the larger one 128 centimetes in circumference.

Junipers grow all over Steins Mountain, almost down to the valley bottom, in open groves or scattered trees. Often many square miles of the lower slopes and smaller areas of the upper slopes being devoid of trees.

Snow lay on the upper slopes of the mountain, which may have been two thousand feet higher, and bore only junipers so far as the eye could tell. No pines are said to occur in the mountain.

Aneroid at P Ranch 4090.

July 23, 1896.

Aneroid at P Ranch. Minimum 8° C
Leather 3950
Started for Shirk at 6 A. M.
Summit of divide near P Ranch 4510
Divide at the gap about 7 miles from P Ranch 4300 ft.
Characteristic vegetation most of the way Artemisia tridentata and Bigelovia douglasii.
Catlow Valley bottom 4200 ft, with juniper on hills to the east.
Shirk 4260 feet. Lunched her, met Streeter, saw Mrs. Shirks collection of arrow heads and knives, left her some dried, and went on to Beattys Butte to join Leiberg. Passed the following:

Artemisia tridentata
Sarcobatus
Atriplex nuttallii
Eurotia lanata
Hordeum

} Probably six miles square of this, grazed by horses & cattle, very level, mealy white soil, dusty, alkaline, whirlwinds.

At the edge of this plain, first Artemisia spinescens, Grayia spinosa, Artemisia tridentata. Westward in the sage brush were Bigelovia douglasii Tetradymia spinescens and T. glabrata.
Approaching Beattys Butte, at 5100

was found Tetradymia comosa; at 5750 Symphoricarpus, at 5900 Balsamorhiza sagittata.

Pass in saddle of Beattys Butte 6100. Camped on the west slope at 5800 feet

Cercocarpus ledifolius on south butte, no juniper and no pines.

Found Leiberg, with his outfit. He had ascended the north, main butte and made it feet above the camp.

July 24, 1896.

At Beattys Butte. Minimum 3.5° C.
Leather 5800 feet. Green 5890 feet.

Proceeded westward to Guano Ranch. Miles of Artemisia tridentata and Bigelovia douglasii with occasional Grayia and Tetradymia glabrata. Plain about 5000 feet high, broken and rolling.

Guano Ranch 4975. A large marsh bordered by Artemisia Canoides, Iva axillaris, Polygonum and a sort of beach formation of annuals, followed by the marsh proper of Eleocharis palustris and great gray patches of Arnica

Camped at Guano Ranch, near house at 5015 feet.

F. S. Rieder
Brasa, Argon
(P. Romer.)

July 25, 1896.

Camp at Guano Ranch. Leather 5-115. Green 5-175.
Set out with pack outfit for old Camp Warner,
in the mountains on the east side of
Warner Lake, not the Camp Warner of the
Land Office map. Went about 5 miles northwest-
ward from the ranch and then striking into
the valley of Warner Creek (Guano Creek in
local parlance.) Scant juniper and a few
small grove occasional all along. Artemisia
canoides grew along the creek bottom
and A. arbuscula over most of the rest of
the country, hardly any A. tridentata
being seen for 10 or 12 miles. Kunzia
tridentata, Spiraea dumosa, Tetradymia can-
escens, Ribes (cereo-glabrum), Symphoricarpos,
and Amelanchier grow in suitable localities,
the first three very sparingly and only
at and above 5-750 feet. At 5-775- Cerco-
carpus ledifolius. At 6000 Old Camp Warner,
about 20 miles from Guano Ranch. Tools fie-
tures of old fort. Sagebrush in one of the houses 6 cm.
in diameter. About 40 trees (mature) of Pinus ponderosa,
several hundred young ones. Here also Balsamorhiza
sagitata, Eriogonum ramicens Acamothus
vehtinus, Paeonia brownii. At 6250 Cercocarpus
ledifolius. Prunus (emarginatoides), At 6650

Berberis aquifolium. At 7100 Ceanothus velutinus, Viola (venulosa). Summit of Warner Mountain 7850.

Camped on a stream flowing to the northward, at 7350 feet.

389 grouse and a herd of 15 or 20 antelope seen to-day.

~~The~~ Warner ~~Mountains~~ Range ~~are a range~~ lies north and south, is abrupt on either side, with some gentle slopes on the east, particularly toward the north, 10 to 15 miles long. Heavy snow drifts still lay in patches near the summit on northerly slopes, and furnished water for perennial springs and streams. The rounded slopes are covered with grasses and Artemisias, chiefly arbuscula, the grass principally Festuca ovina ovgana. Horses, cattle, and sheep are grazed on the mountain, but there is abundance of grass at present. Occasional groves of Cercocarpus occur, and on steep northerly slopes a chaparral of Ceanothus velutinus, often mixed with Prunus (emarginatoides) and Ribes cereum, or a small growth of Populus tremuloides. One tree of Pinus ponderosa was seen in a gully leading down the west slope of the mountain.

July 26, 1896.

At camp on the Warner Range, readings were Leather 7260, Green 7400. Minimum 0° C. A slight dew fell, but there was no apparent frost in the morning.

Saw a flock of 55 sage hens coming to water.

At the base of a snow drift at 7500 feet grew Sibbaldia procumbens and Juncus parryi. Polygonum bistortoides abundant with many other plants collected.

Collected about our camp southward along the top of the mountains and down to the eastern base. About 5 P. M. left the mountain and reached camp at Griano Ranch about 10 P. M.

July 27, 1896.

At Grano Ranch, readings, leather 5-110, green 5-160, minimum 14.5° C.

Set out southward on the road to Bidwell. Passed by Grano Lake, which was alkaline and appeared to contain only Potamogeton pectinatus. Arnica fields around the lake close-grazed. Camped after about 12 miles in a cañon which contained standing water.

July 28, 1896.

Readings at camp in the canon: leather, 5300 green 5300.

Continued on the road to Bidwell, missed it and went over into Long Valley, Nevada. In ascending the divide, which was 5800 feet Kunzia tridentata occurred within 500 feet of the summit, when all below had been sage brush plains.

In descending, passed an alkaline flat in the hills which was colored a peculiar blue, similar to that of the Armica swamps, by Artemisia cana, altitude 5600.

In the head of Long Valley, passed a flat covered principally with Iva axillaris which at a distance gave it the color of a green meadow. Almost the only other plants it bore were Smelowskia fremontii, Eryngium o , and Oenothera nuttallii.

Camped at the Boat Ranch, 5510, 5540

July 29, 1896.

At the Boat Ranch, Long Valley, Nevada Readings:
5450. Min. 3° C.

Took the road to Coleman Valley, northwestward about 22 miles and camped at the ~~foot~~ of the ranch, 4000 feet.

In the afternoon ascended the mount range to the west.

Found at 5000 feet
Amelanchier alnifolia
Juniperus occidentalis
Balsamorhiza sagittata.
Parrya
Prunus demissa
Populus tremuloides
At 5100 Holodiscus discolor
At 5200 Prunus emarginatoides
At 5700 Ceanothus velutinus
Cercocarpus ledifolius
Berberis aquifolium
Abies concolor.
Altitude of summit 6200.

The mountain is bare of large timber except a few scattered white fir and apparently a few miles farther north an occasional yellow pine, Pinus ponderosa.

July 30, 1890.

Coleman Valley (our camp doubtless south of the Nevada Line). Minimum 3° C.

Took the old road over the mountains toward Bidwell. Summit of divide 6400 feet. Descended on the eastern slope through a rocky, juniper-clad valley with an altitude of about 5000 to 5~~2~~00 feet.

Reached Bidwell, an old army post, now a farming community and town, with a great deal of ~~irrigated~~ land which cuts wild hay. This is commonly stacked on platforms, with places for cattle shelter beneath.

Mountains to the west of Bidwell thinly timbered with pine, and with an occasional patch of snow.

Camped along the main stream in the edge of town.

July 31, 1896.

Readings at Bidwell: 4350, minimum 7.5° C.
Started for Lakeview, Oregon, going southward about four miles then over the mountain westward.

At 5000 feet

Pinus ponderosa
Cercocarpus ledifolius
Amelanchier alnifolia
Wyethia also at lower elevation
Balsamorhiza sagittata.

At 5700

Prunus organa
Ceanothus velutinus
Berberis aquifolium
Abies concolor
Prunus (emarginatoides)
Ceanothus prostrata

Summit 5875 feet. Mountains toward the west all heavily timbered.
Fandango Valley 5000 ft.
Camped about 14 miles south of Lakeview.

August 1, 1896.

Went on to Lakeview.

August 2, 1896.

Reading at Lake View 4600 feet.
Set out for Fort Klamath, by way of Bly.
Artemisia tridentata, cana, and arbuscula were seen in abundance on the road to Drews Valley in suitable locations.
In ascending the hills west of the Goose Lake Valley, at 4800 appeared Purshia tridentata and Pinus occidentalis among the sage bushes.

At 5000 feet

Pinus ponderosa
Cercocarpus ledifolius
Arctostaphylos patula
Ceanothus velutina
Berberis aquifolium
Ceanothus prostrata

At a distance, a few hundred feet above were seen trees undoubtedly of Pinus lambertiana. Fence rails of Libocedrus decurrens were occasionally seen along the road.
Camped at the second ranch in Drew Valley.

August 3, 1896.

Pine Valley camp. Aneroid 4875. Minimum 8° C.
Set out on horseback for Cougar Peak (Lo. Chevvis Peak of the War Department map.)
The pines and other characteristic timber, as recorded yesterday began practically at one or two hundred feet above camp.

At 5500 feet ~~began~~ collected Lotus crassifolius.

At 6550 was a dense grove of Abies concolor.

At 6900 occurred the first Castanopsis, in the grove

At 7100 Pinus ponderosa was scarce and stunted.

At 7300 Castanopsis formed dense thickets on the open mountain slope, all the trees except a few scattering white firs (Abies) having ceased. The first Pinus albicaulis occurred here, with ~~Spiraea~~ Holodiscus discolor on the rocks. A dense chaparral, mostly of Ceanothus velutinus, Prunus (emarginatoides) and Populus tremuloides covered the ground.

At 7500 occurred great patches of Arctostaphylos nevadensis.

The summit was at 7675 feet, and bare of trees except an occasional Pinus albicaulis and Abies concolor (no lasiocarpa seen). Arnica aculeata and Pellaea also occurred here.

Going down the northeast slope, at 7450

Pinus murrayana and Pinus lambertiana
come in, just below the Pinus albicaulis.
In a small mountain meadow at
8150 feet, many plants were collected and
Juncus confusus seen.
In a big meadow at 6700 more plants
were collected. A large quantity of Pedicularis
attollens occurred here. A handful of Lau-
entia contained 172 plants, mostly in flower.
At 6200 occasional trees of Libocedrus de-
currens began to occur among the yellow pines
and fir.
At 5400 Ribes Kunzia tridentata and Juniperus
occidentalis began.
Returned to Dorw Valley camp.

August 4, 1896

Camp in Drew Valley. Aneroid 4740. Minimum −6.5°C. Heavy frost. Thermometer exposed on wagon seat & dew and frost. Woodwork metal, and glass covered with frost.

At noon ~~left~~ camp and went on toward Bly. Head (i.e. west end) of Drew Valley 4900 feet. The yellow pines here come down to the valley bottom with a solid front. Along the road at this altitude occurred

Pinus ponderosa
Populus angustifolia
Abies concolor
Pinus murrayana, along the stream.
Populus tremuloides
Ceanothus velutinas
Ceanothus prostratus
Spiraea pink.
Amelanchier alnifolia
Galium boreale
Cerastium (edule)

Camped at the lower (eastern) end of a meadow about 10 miles from the last camp. Aneroid reading 5250.

Nymphaea polysepala in the meadow stream. This was seen also in the large meadow near Conyar Peak.

August 5, 1896.

Aneroid reading at camp 10 miles west of Deer Valley 5250. Minimum 0° C. under a large yellow pine in the forest 20 feet above the meadow bottom. Slight dew in the meadow, and traces of frost.

In the meadow were noted besides other things Mimulus primuloides, Lophiocarpus and Arnica (stilted).

Set out from camp for Bly. In the pine forest were observed the following:

Pinus ponderosa
Pinus murrayana, abundant.
Abies concolor, scarce.
Populus tremuloides
Purshia tridentata
Ceanothus velutinus
Ceanothus prostratus
Arctostaphylos patula, very little.
Ribes cereum
Wyethia, no Balsamorhiza sagittata.
Potentilla, purple
Geum triflorum.
Epilobium spicatum
Gilia aggregata
Berberis aquifolium
Libocedrus decurrens, a single small tree.

Cercocarpus ledifolius, on open slopes.
Juniperus occidentalis, " " "
Galium boreale
Prunus emarginatoides.
" demissa.
" organa.
Paeonia brownii
Hieracium
Geranium
Amelanchier alnifolia
Arnica (cordata)
Arnica (moschatoides)

Altitude of divide between Drew Valley and Sprague River 5450

On the descent collected Rhamnus at 5150.

At 4850 the Pinus ponderosa thins out and the southerly slopes of the mountains are covered by Artemisia tridentata, A. arbuscula, Kunzia tridentata, and scattered junipers. One long lava slope at the southwest foot of Gaylart Mountain, with extremely thin soil covering is entirely devoid of ~~even~~ these woody plants.

Altitude reading at Bly 4330. The Arnica occurs in the great meadows at Bly.

Camped on the North Fork of the Sprague River about miles above its junction with the main ~~river~~

Altitude 4500 feet.

August 6, 1896.

Altitude reading at camp on the north fork of Sprague River ~~=~~ 4475 feet. Minimum 10° C, thermometer on woodwork underneath wagon box. Cloudy yesterday afternoon and this morning, a smart shower and distant lightning during the night.

Remained at camp all day, collecting in the vicinity.

Aneroid reading at camp in the evening 4450

August 7 1896.

Aneroid reading about 5 o'clock P.M. on North Fork camp 4375. Minimum 2° C.

Set out for ~~Goatleaf~~ Peak. Aneroid reading before starting, about 8 o'clock, 4325.

Route from the start through a Pinus ponderosa forest.

At 5180 Pinus lambertiana seen first, only a very few trees altogether on the mountain.

At 5250 collected Pyrolas and Lonicera.

At 5625 collected Pyrola aphylla.

At 6000 collected Chimaphila umbellata.

Lunched in a ravine at 5650.

At 6800 feet Pinus murrayana was common on the dry mountain slope.

At 7000 Pinus ponderosa had become scarce

At 7000 Pinus ponderosa ~~scarce~~ gone.

At 7700 on south slope Pinus albicaulis began.

Left our horses and pack outfit in a small meadow and ascended the highest peak. This was about 8200 feet, the aneroid reading only to 8000 feet, the rest estimated.

On the summit were Pinus albicaulis, and the following:

Phlox apposa var. nana.

Holodiscus discolor
Arenaria aculeata
Pentstemon davidsonii
Arabis lyallii no.
Juncus parryi
Sphaguea
Juniperus alpina
Danthonia unispicata.
Pentstemon deustus.
Camped in the meadow at the east foot of the peak at 7560 feet altitude

August 6, 1896.

Campdon Gearhart Mountain, County, Oregon.
Aneroid at camp, 7575. Minimum 3° C.
Collected about the meadow and returned to camp on Sprague River. Aneroid at this camp about 4 P. M. 4390.

Saw at 6300 feet in the yellow pines on an open south slope the highest Cercocarpus ledifolius, Juniperus occidentalis, and Kunzia tridentata.

Of trees saw in these two days, besides those already noted.

Libocedrus decurrens, occasional in ponderosa.
Abies concolor, abundant in ponderosa.

The following plants, in addition to those collected were also seen.

Ribes cereum, abundant above the yellow pine [and in it.
Balsamorhiza sagittata.
Wyethia mollis
Amelanchier alnifolia
Ceanothus velutinus, forms chaparal in ponderosa [does not occur above it.
Prunus emarginata.
Eriogonum (unicum) not seen
Paeonia brownii
Berberis aquifolium
Apocynum androsaemifolium
Pteris aquilina lanuginosa.

Populus tremuloides
Prunus virginiana
Ceanothus prostratus
Arctostaphylos patula
Galium aggregata
Hieracium
Arnica cordifolia
Juncus parryi, abundant from 7500 & 8200 ft.
Polygonum bistortoides
Castanopsis not seen
Arctostaphylos nevadensis, boreal Encountered in this
Pedicularis groenlandica. P. attollens not seen.
Juniperus alpina. On exposed rocks 7600 & 8200 ft.
Saxifraga punctata not seen.

August 9, 1896.

Thermometer at Sprague River (North Forks) camp 2.5° C.

Traveled westward onto the Indian (Klamath) Reservation and camped on Sprague River about a mile east of the Yainax Bridge. Aneroid reading here 4150 feet.

August 10, 1896.

Traveled westward across the reservation from the Yainax Bridge camp to Chilicans Bridge (over the Williamson River) and camped there. At Yainax Bridge camp minimum was 2.5° C.

All the way through forest of yellow pine, with occasional meadows. Kunzia tridentata very abundant, comprising one-third or more of the bush in the sage brush openings and in adjacent yellow pines sometimes forming almost a chaparral by itself. Aneroid at Chilican Bridge 4110

August 11, 1896.

Aneroid at Chilicum Bridge camp 4020. Minimum 4°C.
Went from Chilican Bridge to Old Fort Klamath and camped on the old grounds. Aneroid 4020 at old Fort Klamath.
Went to see Mr. Burton . Cunningham.

August 12, 1896.

At Fort Klamath minimum 3° C.
Set out for Crater Lake.

At 4200 feet, in a forest of Pinus ponderosa, P. murrayana, & Abies concolor, with underbrush of Ceanothus velutinus, Kunzia tridentata, Ribes cereum, and Prunus emarginata, Ribes ~~sanguineum~~ and Arctostaphylos patula, we began the real ascent of the mountain.

At 4300, in a ravine on a north slope, occurred Pinus lambertiana, Pseudotsuga mucronata and Libocedrus decurrens.

At 4600 Abies nobilis was seen

At 4600 the first tree of Tsuga pattoniana occurred.

At 5000 feet Pinus ponderosa gave way to Pinus murrayana, with Pinus monticola (also P. lambertiana?), Abies nobilis and an underbrush of Arctostaphylos nevadensis.

At 5300 the Abies was replaced almost entirely by Tsuga pattoniana.

At 5700 Abies lasiocarpa and an occasional tree of Pinus albicaulis came in. Juncus parryi abundant.

Camped at a little spring just south of the Pole Bridge, at 5700 feet.

Aug. 13, 1896.

At Pole Bridge Camp, minimum 3.5°C, with some dew. Green aneroid which will be used in the Cascades 5°675', leather 5°650.

Set out for Crater Lake and after about a mile met Mr. Diller, who returned with us to his camp on Crater Lake.

The forest on the way up is composed of Tsuga pattoniana, Pinus murrayana, Abies nobilis, and Abies lasiocarpa. A few trees of Pinus albicaulis occur along the rim of the crater opposite our camp. Drifts of snow are lying in the woods for the last 500 feet in abundance.

Gilia aggregata occurred frequently in open places in the forest below 6500 ft.

In the afternoon collected down the inside slope of the crater to the water, about 6200 feet altitude. Altitude of camp, according to Mr. Diller about 7100 ft. Aneroid reading 7000.

Dr. Merriam and Bailey came in the afternoon.

About the crater are the following trees.

Tsuga pattoniana
Abies nobilis
Pinus murrayana
Pinus albicaulis
Abies lasiocarpa.

Mr. E. I. Applegate, of Klamath Falls, Oregon, a student of Professor Dudley at Stanford University, an enthusiastic botanist, who will furnish reliable data on the botany and timber resources of his region.

August 14, 1896.

amp at rim of Crater Lake, Oregon.
nroid 7075. Minimum 9°C.
About camp.

Veratrum viride, in large patches.
Juncoides glabratum, abundant under the [types
Evernia vulpina

Mr. Applegate states that the Klamath Indians smoke Arctostaphylos patula.

Camassia esculenta used by the Klamaths. Dug in June with an iron bar about 3 to 4 feet long, with a cross bar for a handle at the top. With this they pry out the roots. They are roasted in a steaming pit, and form a delicious article of food.

Went down the slope of the crater ~~Canon~~ and took the newly constructed boat to Wizard Island, with Dr. Merriam and Mr. Diller. Aneroid reading at the shore 6075. The forest about the Island and running up the slopes of the crater are made up of Abies nobilis, Pinus monticola, Tsuga Patoniana, and at the summit Pinus albicaulis in small amount. Other plants were seen besides those collected, as follows.

Penstemon davidsonii, abundant base to summit.
Arctostaphylos nevadensis

Spraguea umbellata.
Sorbus sambucifolia, occasional
Hieracium albiflorum, among the trees.
Ribes (repens)
Poa collected on Steins Mountain fide Leiberg)
Carex
Bikukulla formosa
Phacelia magellanica
Arenaria (collected near Crater Lake camp)
Pyrola secunda
Chimaphila umbellata
Polygonum ~~laricifolium~~ newberryi
Pyrola picta
Pyrola dentata
Eriogonum
Holosericeus dic color.
Juncoides glabratum
Aster (same as no.
Vaccinium
Cryptogramme acrostichoides
Abies lasiocarpa, a single tree seen at the northwest shore of the lake
Sambucus, probably the red-fruited one
Epilobium spicatum.

The summit of the cone, about 800 feet above the water carries a depression probably 150 feet deep, about one-third occupied by a snow drift. Here grow Juncus parryi, Hieracium gracile Carex. , Arabis

The following plants in addition to those collected were noted by Mr. Leiberg on the mainland to-day.

- Bikukulla formosa
- Viola (collected on Gayhart Buttes)
- Senecio triangularis)
- Ranunculus (coll. in upper meadow on Gayhart)
- Polygonum bistortoides
- Dodecatheon
- Mimulus leviseii
- Pedicularis groenlandica
- Pyrola picta
- Eriogon salugineus
- Claytonia (small, teete-leaved, bulbous)
- Lappula diffusa
- Arabis lyallii
- Gilia aggregata.
- Aquilegia formosa
- Potentilla glandulosa
- Sorbus sambucifolia
- Valeriana (same as on Cougar Peak)
- Kelloggia galioides
- Bromus grandiflorus
- Collinsia parviflora
- Phlemm alpinum
- Saxifraga integrifolia
- Aconitum columbianum
- Ribes lacustre, Oxyria digyna.

August 15, 1896.

Crater Lake camp. Aneroid 7100. Minimum 9°.

Went with Mr. Leiberg westward along the crater rim to a point about a mile and a half northwest of Sentinel Peak, then southward a mile or two and southeastward to the bottom of the crater rim, about 1000 feet below its summit. Here were a line of springs. Then we came back to the summit of the rim and then eastward to camp.

Took many photographs of trees, and one each of Polygonum bistortoides, Pedicularis groenlandica, and Dodecatheon ,
all there in ~~the~~ a meadow at a reading of 6250.

August 16, 1896.

Crater Lake Camp. Aneroid 7025. Minimum 9°C.

Dr. Merriam brought in a specimen of Castanopsis chrysophylla from the rim of the crater, about a mile and a half west of camp.

Looked over Mr. Applegate's collection and found the following not yet recorded here. Beneath

Smilacina with paniculate flowers and basal glaucous

Viola glabella

Spiraea "betulifolia"

Viola blanda.

Polemonium foliosissimum?

The following plants are additional to those already recorded here.

Phlox douglasii?, collected on Gayhart Butte.

Gayophytum, torulose, affixed

Lupinus, collected in Fandango Valley

Lupinus, collected on Gayhart Butte.

Bikenkulia ninflora

Rumex acetosella

Veratrum viride

Mr. Applegate's uncle informs me that the Indians used Juniperus occidentalis for bows and "wild flax", Linum lewisii, as the source of a fiber for thread-making.

Crater Lake Camp. August 17, 1896.
Minimum 9° C.
Remained in camp all day.

Crater Lake Camp August 18, 1896.
Minimum 10° C.
Aneroid
Met Mr. A. G. Johnson, Astoria, Oregon, who promises bulbs of Erythronium johnsoni.

August 19, 1896.
Crater Lake Camp.
Minimum 10.5-° C.
Went down to meet Mazamas in morning.
Remained about camp all day, gave a talk in evening.
Maximum 23.25-° C.

August 20, 1896.

Left the Crater Lake camp in the morning. Altitude at the Klamath – Rogue River divide 6170.

Pole Bridge 5200.

At 5150 Ceanothus velutinus first seen, with Pinus ponderosa.

At 4750 Abies grandis, Pseudotsuga mucronata

At 4300 collected sugar pine cones.

At 4250 Kunzia tilesdata in abundance.

Camped at old Fort Klamath, alt. reading 4025.

Old Fort Klamath, August 21, 1896.

Went down to White Cindy's about 12 miles below camp, and secured a great deal of information about the aboriginal uses of plants.

Minimum 4.5° C

Aneroid 4025.

Maximum 26° C.

Klamath Agency, August 22, 1896.

Remained at Fort Klamath till after lunch and went down to the agency. Here Mr.

Leiberg and I separated for the season,
I stopping at the Agency.

Klamath Falls 4/84 according to contour maps.

Bryce Lake, Klamath Co. Oreg., July 23, 17.
At Brooks ranch, near Klamath Falls Ore
gon.
Therm. 6°C. offered to the
Geological survey record 3.50
by indirect . 7.00

Left Fun for the Cascades with
five pack horses, and to Fremont with
one pack horse. Ind two
men each.

Homer V. Applegate, assistant, Klamath
Falls, Klamath Co. Oregon
Fraser Bennett, Cook and packer, Klam
ath Falls, Oregon.

West through mountainous coun
try some three or four miles, cross
ing several streams flowing
Eastward
Big Spring creek
- pasture meadows
- timber
Some scattered
timbered
Last meadow - Swimming
about 500 feet - some grass in the
meadow - timber
- Cross several streams flowing Eastward
- mountainous country

Picea rubra a mile at Long Lake, head [illegible] east side; found [illegible] lumber on the east side, logs like on it shall start [illegible] miles from the south end of the lake. At this point we had come through most [illegible] the trees, the fire is yellow.

Picea canadensis, [illegible]
Betula papyracea, [illegible] in
[illegible] other situations.
Abies balsamea, smaller amount
Larix laricina, occasional.
Picea rubra near [illegible].

The characteristic shrub of this
[illegible] is the form of
Cornus stolonifera, most [illegible]
Prunus pumila, [illegible]
Betula glandulosa [illegible]
[illegible] pubescens,
[illegible]
Of the lower shrubs, [illegible] one,
is [illegible] to some extent into the yellow [illegible]
woods, is [illegible]
[illegible]
[illegible]
At Long Lake [illegible] in

[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

[illegible]
[illegible]
[illegible]

Mr. Applegate says Pseudotsuga mucronata grow here not.

Photographed [illegible] about 200 feet on the west side of Aspen Lake and (3) Aspen Lake looking north from near center of ~~east~~ same lake, showing mountains in distance.

In afternoon, about 3 o'clock, we found south end of Aspen Lake near ridge westward, and we then came down (same ridge or next one to Crane locality) to Land Office road, to Bunch Lake. Less yellow pine as we ascended, with more Juniperus, Pinus Lambertiana, and Abies magnifica. In this higher portion of the yellow pine belt, Peucephyllum pygmaeites, and Cardanopsis chrysophylla minor were abundant, still accompanied by Ceanothus velutinus and Ceanothus prostratus. A little Arctostaphylos nevadensis was seen also. Near Bunch Lake, Pinus murrayana became abundant, the first specimen having been seen near Crane Lake.

Camped on Bunch Lake, a small round marsh near its outlet.

Hiked about 25 miles today.

Bruce Lake, Renfrew Co. Aug 2 1917.

Wea. 4°C. over the snow dew.

B. 4700. L. 4700.

Collected plants at the morning immediately about camp. The forest about me is mostly = the tamarack swamp, Picea mariana, Pinus banksiana, Pinus resinosa, Pinus monticola, with scattered trees of Pseudotsuga taxifolia. The undergrowth is chiefly Ribes triste and Taxus canadensis, with the Labrador tea, Ledum groenlandicum, and Kalmia polifolia var. angustifolia, Vaccinium myrtilloides, Vaccinium canadense, Gaultheria procumbens, Cornus canadensis, Linnaea borealis var. americana, Clintonia borealis, Maianthemum canadense, Smilacina trifolia, Streptopus roseus, Coptis trifolia, Rubus pubescens, Rubus idaeus var. strigosus, Rubus triflorus, Rubus parviflorus, Rubus pedatus, Rubus acaulis, Rubus chamaemorus, Aralia hispida, Aralia nudicaulis, Cornus stolonifera, Cornus alternifolia, Viburnum cassinoides, Viburnum pauciflorum, Viburnum opulus var. americanum, Lonicera canadensis, Lonicera oblongifolia

At 3 o'clock in the afternoon we went for a ride of the Woods, not by the road but by a very rough trail which is in it. Very little Pinus resinosa is seen, the forest consisting chiefly of Picea mariana, Pseudotsuga taxifolia, Pinus banksiana and Pinus monticola. About 1/2 mile from Bruce Lake there is a shallow pond in the south end of which Ribes triste and Ribes pauciflorum, Cornus oblongifolia

Pinus ponderosa, Pinus
flexilis. Pinus albicaulis on
P. aristatus are also up in
elevations above those where the above are
found. No sugar pine, fir,
spruce, hemlock, or deciduous trees
seen. On the summit of the ridge,
at 300 feet above Rock Lake, Pinus
albicaulis came in, and
to south and Lake Rock
Pines columbiana.

West of the fir was through
mixed forest. At one point for a
long distance the Pinus monticola
in the valley bottom had been
killed but the fir although it had
run into the upper Pseudotsuga
in drier exposures not so
were true fir. This is undoubt-
edly due to the thin soil the
snow and the thick moss
water, and which was to the
fact that the valley bottom con-
tains a denser undergrowth.
Often in this and other woods

[illegible] Pinus contorta [illegible]
Pinus ponderosa, [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] Pinus ponderosa. On [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible]. In a Pinus ponderosa
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]

Lake of the Woods, Klamath Co, Oregon July 25, 1917.
Min. 25°C. E. 4400 A. 4880.

Collected in the forenoon about camp, from the [illegible] to the [illegible] in [illegible].

In an area burned over last year, but not so severely as to kill the large fir, pine conifer and Pentstemon, moderate but it entirely, seedling one of these two probably the more are abundant, showing that these have come up [illegible] since the conditions. Specimens were collected in the dense burn [illegible] some-times, with the ground, [illegible] ing [illegible] directly from the soil. Some the [illegible] were [illegible] in very [illegible].

In the afternoon collected along the [illegible] road toward [illegible] the west of the last stage, the [illegible] the north side [illegible] Rock. On the slope [illegible] were found this conifer, Pentstemon [illegible] Aster [illegible], Abies [illegible] pine [illegible] in [illegible]. Erigeron, Pentstemon [illegible]

Here a scarce few trees of Pinus albicaulis

Lake of the Woods to Bryce via Deadman's
Wash. 5°C. 4350 ft. 4330.

Left camp this morning following the Dead Indian road toward Pelican Bay and leaving it in order to round the marsh at the north end of Lake of the Woods. Then we struck through the woods direct for Mount Pitt, and ascended its eastern slope intending to camp near snow. In leaving about 200 ft elevation below and ten- ing better soil we passed out the yellow-pine, we ascended now the steep + rocky canyon there about a mile west of the east end of four Mile Lake.

The forests through which we have since mainly consist chiefly of Pseudotsuga mucronata and Libocedrus, mixed with moderate Pinus monticola, and along the west shore of the east side of Lake of the Woods an occasional Pinus ponderosa. Pinus murrayana was abundant, especially on west side. One tree of Pinus albicaulis was seen along the east or west side of Four Mile Lake. This species was obtained

[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

Mon. Oct 2 d 5720 L. 5740

For the day, Camped on Bryan, Aug 28, 1911.

Left camp at this morning on foot with Mr. Wapple, and ascended Mt. Pitt, reaching summit at 1:30. Started back at 2:30 and reached camp at 4:30 P.M.

So far as I see the mountain is a mass of rock, mostly Pinus murrayana, badly burned and eaten away by snow which appears to be 8 to 10 feet deep according to where one looks. The most abundant undergrowth is Ceanothus cordulatus and Arctostaphylos nevadensis. One level of this forest is about 5000 feet.

The whole forest growth is not dense, the rocky loose soil holding not a sufficient amount of water to support a dense forest. From the base up to about 7000 feet the trees are chiefly Abies shastensis, Tsuga hetonii, Pinus monticola and some Pinus murrayana, the principal undergrowth being Arctostaphylos nevadensis, Vaccinium cordaicum, and Ribes roezlii, the first in the more rocky and exposed situations. Tsuga hetonii runs up to

Juniperus scopulorum occured sparingly at about 7000 ft with a few plants of Holodiscus discolor.

Aneroid readings at camp after storm, am.
A 5750
A 5700 This is the instrument used to

near 2 - 0 at accompanied by Pinus aristata, without undergrowth, and Salix very scarce, from this altitude to about 9200, the upper limit of trees on the south side, the only tree being Pinus albicaulis.

Above 7000 feet the scattered herbaceous vegetation is made up of Penstemon davidsonii, Arabis, Eriogonum ovalifolium, Erigonum flavidum, Orthocarpus tolmiei, Vaccinium scoparium, Cryptogramma acrostichoides, Juncus parryi, Luetkea pectinata, Kobresia scopulorum, Sedum lanceolatum and Arenaria nana were the only plants seen above timber line. At the very summit there was no soil to support vegetation, only the boulders lichens black, yellow and grey.

On the south side the flora of the mountain is very scanty, the stones and boulders at the base having only for the most part collected.

Distance made today about 8 miles.
About 100 of horse allowed today.

Near Mill creek, Klamath Co, Oregon, July 28, 1911.
Elev. 7,[illegible] ft. B. 52.5° C. 5 P.M. 52.5° C.

Walked west & sth on mountain. Found Iris tenax on the shore. The lake near camp, and P. Gilesate found both it and Pinus columbiana about one of the meadows near camp.

Left it was found that Pinus monticola & Pinus columbiana are not present along the lake shore.

Young conk, which is on a - in my hands the true fruit of Pinus ponderosa, totally different and new, the brown hair-like vegetation being enormous [illegible] and very [illegible] shot, especially on the white parts of the [illegible] over the rest, as in dead Pinus Murrayana & Pinus monticola, [illegible] dense [illegible] & Pinus contorta, [illegible] shown in the [illegible] in his, and Pinus contorta. [illegible] was made by Mr. Gifford [illegible] [illegible] me in the [illegible].

[illegible] [illegible] [illegible] [

[illegible] Pine Hill [illegible]

[illegible]

[illegible]

[

Leaves [illegible] removed

upon [illegible] ...
...
... dividend along the margin on the ...
... not: Rhus Toxicodendron ...
... ; ...
... ...
... Rhus venenata, ...
... ...
... Bursera ...
... ; Rhus ...
... along the ...
...

Several ... ...
... ...
... ...
... the ...
... ...
...

Distance traveled 22 miles

Maximum for the day 21.0°C.

Capt. Apple [illegible] was his address in Medford, Mass.

From letter received from Dr. E. Kirchgessner dated Medford, Mass. Sept 26, 1893, it is learned that this legend was painted September 26, 1893, by Dr. Kirchgessner's brotherinlaw, Mr. R. L(?) Heath, of Chicago, Ill.

Crater Lake, Oregon Sunday Aug 27
min 7° [illegible] a.m. 6000 h. 7100.

Went down to the boat landing this morning. On a rock on shore a few yards east of the landing is the following inscription by Dr. Kirchgessner.

[illegible]

The water came to 4" on the inscription. The lower end of the 4 is 27 inches below the surface of the water.

Dr. K attached boulder to the [illegible] west of the boat landing in the water found by F. Trachsberger,

Aug. 15

1892

The lower end of the "9" is 12 inches [illegible] the water.

A [illegible] like line on the rock about six inches above the water was to indicate the maximum [illegible] the waters during the highest season.

A straight mark on a [illegible] six feet ~~miles~~ made out of the water ten inches above water.

[illegible] same [illegible]

This rock can be reached only by boat.

The "ft." is written in capitals thus, FT

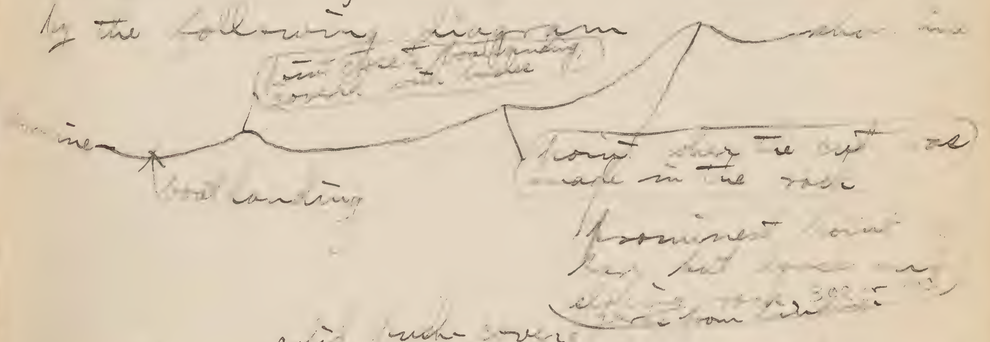
This rock can be reached on foot.

[illegible] rock [illegible] at about [illegible] mark, this mark being [illegible] measurement of 16 inches below the surface of the water.

About 200 yards east of the boat landing, on a small island, is a rock [illegible] with [illegible] numbers, a [illegible] and a line [illegible] from the water. One of this rock [illegible] with cold wind, about 3 feet above the surface of the water, a horizontal mark, probably 6 inches long, and beside 3 ft. as follows:

3 ——— FT.

The position of this point is indicated by the following diagram [illegible]



On a vertical rock [illegible] 15 yards west of the boat-landing [illegible]

Send a copy to Captain Hylerto.

cut a corporal mark next bar inside long and then last one to outer. Blood to mark we cut a C, thus.

C

Mr. Burton L. Cunningham, Assistant Mr. Stubbs the boatmen was with me when these marks were cut.

Near the lower camping ground at Crater Lake
has large fire / Abies amabilis were
measured, one 15 ft. 8 in. the other
10 ft 7 in. in diameter.

Crater Lake Oregon Aug. 2, 1904

Min. 6° C. [illegible] 6625 feet by A 7205 No dew.
Very wind all night from the northwest, not
a clouds.

Set out for Huckleberry Mountain, going
down the west slope of the Cascades about
11 miles from the [illegible] the Rogue River - for the
main road before turning up into the moun-
tain. Stopped for lunch at Whiskey Creek 9
miles from the summit.

In descending the mountain, at a reading
of B. 5400 Pinus monticola began to
occur, and at 4700 Pseudotsuga mucronata.
The reading at Whiskey Creek is 4400.

I estimate 3000 acres / burned timber
passed through to this point, chiefly Pinus
monticola, but some fine tracts also
of Abies shastensis. At the higher eleva-
tions burns of monticola seemed to
become reseeded nearly, at least after
the second burn, and to become
grassed over, [illegible] with Lupinus
[illegible], Festuca scabrella, and
another grass with very slender stalks,
Poa [illegible] also occurred [illegible]

At Whiskey Creek, junction rd No. 5

Abies tenuifolia grows along Whiskey Crk.

some extent. The undergrowth of the mature forest is chiefly Ribes cereum and Arctostaphylos nevadensis, the former prevailing in its upper elevations the latter in the lower.

About the Whiskey Creek crossing occurred Pinus murrayana, Abies shastensis, Pinus monticola, Pseudotsuga macrocarpa and Picea columbiana; the last only along the stream. It was seen also in wet soil near the Horse Creek, two thirds the way to the summit. Tsuga pattoniana occurs near the stream, or down. The undershrubs are Pachystima myrsinites, which began about with the Pseudotsuga, Rubus vitifolius, Vaccinium ecoparium, Rubus leucococcus, Gaultheria, and Berberis nervosa. Such herbaceous plants as Vancouveria and Linnaea are abundant along the stream.

In the afternoon went on down two miles and turned off on the road to Thunderbird Mountain. As far as the Union Creek crossing the forest is chiefly Pinus mur-

rapens with an understory of Vaccinium membranaceum. A few trees of Pinus flexilis are seen, besides an occasional Pentstemon fruticosus and Ceanothus velutinus.

At Union Creek, which has cut through a deep ravine, an almost complete change in the flora occurs, the trees being almost wholly Tsuga mertensiana and Picea with some admixture of Pinus monticola. Juncus brevifolius occurs almost in the form of a sward. The following form the conspicuous vegetation: Vaccinium membranaceum beginning to fruit.

Castanopsis minor
Ribes lacustre, in wet places
Pachistima
Berberis nervosa
Rubus pedatifolius
" leucodermis beginning to fruit
" laciniatus
Rosa gymnocarpa
Ribes grossularioides
Pachystima myrsinites
Linnaea borealis
Cornus canadensis, just going out of flower
Pedicularis racemosa
Sambucus
Achlys triphylla
Tiarella unifoliata

Going up the trail about four miles from Union Creek we camped near the head-springs of a small stream in a willow-bottomed meadow.

At a reading of B. 4800, the forest changed

The most abundant herbaceous plants about camp are Collomia grayana and Valeriana

endotsuga mucronata,
& Tsuga pattoni, Abies shastensis, Pinus ponderosa and Pinus monticola, and Picea engelmanni Collomia grayana, and Erigeron coulteri came in.

Towards evening went to the summit of a long divide about three miles east of camp towards Union Peak. Along the summit are dry meadows consisting chiefly of Carex tenuisylvanica, with some admixture of Potamogeton interior and Elymus. The mountain slope below, bearing an occidental remnant of snow drift, are covered with Tsuga pattoni and Abies shastensis with an undergrowth in places consisting almost wholly of Vaccinium membranaceum.

The woods near camp are made up of Abies shastensis, Tsuga pattoni, Abies lasiocarpa and Pinus monticola, & a little Abies concolor. The principal undergrowth is Vaccinium membranaceum, with some Ribes inerme, Pachystima myrsinites, and Ribes cereum. Sorbus sambucifolia occurs about the meadows and is quite abundant in the woods.

Distance travelled about 5 miles, making in all about 5 miles more

Upper camp on Huckleberry Mountain, Jackson's Fork, Aug 3,
Min 14.° C, no dew 8 5:50 a 5600

[illegible] camp in the morning [illegible]
[illegible] the [illegible] camp is [illegible]
Huckleberry Mountain, about two [illegible]
the trail from Union Pass. Do
not camp and note water [illegible]
from

Lower camp on Huckleberry Mountain [illegible]
Min. 6.5°; dew 8 4:35

Start on the return to [illegible]
and run to summit, start [illegible]
here at 5:35 P.M.

Wait note and [illegible] and [illegible]
station.

3 miles with [illegible] and [illegible]
the road, 3 miles saw [illegible] [illegible]
that has been set [illegible] time
when [illegible] the road. See [illegible]
the burning adjacent standing timber
[illegible] [illegible] [illegible]
lose [illegible] it. A man [illegible]
[illegible] [illegible] [illegible] as

Captain Dodge & the [illegible] was employed in [illegible] when [illegible] Mr. Dodge [illegible] Mr. Dodge [illegible] Mr. Dodge

[illegible]

[illegible] Rubus [illegible] Vaccinium [illegible] Juncus [illegible] Vaccinium [illegible] most abundant [illegible] plant.

On the [illegible] and [illegible] the [illegible] grass is [illegible] vegetation of Carex [illegible], Eriophorum [illegible], and Juncus filiformis [illegible] [illegible] plant [illegible] [illegible] must [illegible]

[illegible] [illegible]
[illegible]

[illegible] nuri
Listera ovata
Ludia minima
Paradisia
[illegible]
[illegible]
Cephalanthera rubra
Epipactis palustris
Listera ovata
Platanthera bifolia, rhy. v. alb.
Orchis latifolia
Iridea nana
[illegible]
[illegible]
Polygonum persicaria, rhy. v. alb.
Hericium caput, v. alb.
Agaricus [illegible]
Boletus [illegible]
Boletus [illegible]

This last last, most magnified in each as said (in the summer) that pro-
in distance along the roundel not
the rock about 60 yards west, the
highest point

On the knife rest with most white
mottles. Like top then as an

A very little herbaceous vegetation on some
[illegible]

[illegible]

[illegible] Mtn. 2.5° E. [illegible] N. 5° W.

To the west of Mt. [illegible] rising to a rim about 50 ft. the [illegible].

Up to an [illegible] grading of 8,200 ft. [illegible] through a forest of Pinus murrayana, but this gave way to a forest of Pinus ponderosa, with some Pinus monticola and Abies shastensis. At 6700 Pinus Jeffreyi began and at 7300 Pinus balfouriana ceased. In occasional Abies Jeffreyi was found in the ravines and they last were seen at about the same altitude as the last Tsuga. Pinus albicaulis set up to the base of the last crag 50 feet from the top, reading 8450. On the west rim, toward a point about two miles up the lake from our camp, at a reading of 6000 Abies shastensis was abundant in company with Tsuga pattoniana, Pinus monticola and Pinus murrayana. At a reading of 5000 on a southwest slope a few trees of Pinus ponderosa were seen, accompanied by

considerable. Casuarina verticillata on
a little Arctostaphylos tomentosa. Tiger
to the N of the hope was seen a
few old tracks of Felis concolor.

On account of scarcity no specimens
for the relative value of Pinus muricata
& Pinus radiata
as to soil-formers. In a forest of the
latter tree in the east base of Mt. Tamalpais no soil
at all covering over the granite pebbles
had, the trees having merely not effected
any sufficient covering even to conceal the
granite pebbles. But under individual trees
of Pinus radiata in the forest, the soil
was rich with the fir needles rotting
& falling to the ground form a rich vari-
ously decomposed and rotting mass
& along & pine cut later had more
very much as does dried sand. In con-
ect of Pinus the ground is covered
the leaf-carpet to a depth sometimes
ne to two inches. On the drier Pinus
ded of the western slope of Mt. Tamalpais
have a dense shade
ver in the open
ves

Vaccinium ovatum with Arctostaphylos
Vaccinium ovatum does not occur on Mt
ra, Davis. With more moisture it

In the [illegible] and [illegible] the pine [illegible] in which the vegetation consists almost wholly of [illegible] Pinus pennsylvanica, [illegible] and [illegible] small.

Phyllodoce empetriformis, P. glanduliflorum and Vaccinium [illegible] are especially good and [illegible].

[illegible] under the [illegible] pine [illegible] at the [illegible] forest. In a [illegible] [illegible] made by fallen trees [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] under the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

N. [illegible] wooded on [illegible] sides,
[illegible] long wooded about 2 miles.

From a reading of 5400, [illegible] associated with Tsuga [illegible], Pinus murrayana and Betula occidentalis, south of the lake [illegible]

[illegible] on wet bank, Arctostaphylos [illegible] and occidentalis, and Castanopsis [illegible] one Salix, a little Ribes [illegible] in the basin along the shore, and [illegible] scattered shrubs.

N. [illegible] lake, [illegible] [illegible] 7,
1 in. = [illegible] 1500 to 1300.

Made a trip with [illegible] from camp at the south end of the lake, [illegible] summit of Big Bailey Mountain on the north end of the lake, but [illegible] reached the camp [illegible] to the northeast corner.

The [illegible] of Ribes is with Pinus murrayana, Ribes lacustris, Ribes cataria, and Pinus monticola all of which are abundant on the slope of Big Bailey, some of the latter [illegible] the shore of the lake. Passing [illegible] and we found many trees of Ribes oncolor [illegible] the same thing was true along the shore, and on the [illegible] at the north end of the lake Pinus Jeffreyi is abundant, accompanied by some Pseudotsuga mucronata and considerable Pinus murrayana. At a station of 5750 on the ascent, amid Tsuga pattoniana, Ribes lacustris, Pinus murrayana, Ribes

[illegible] Pinus monticola [illegible]
a medium-sized tree [illegible]
[illegible] dbt a tree [illegible] Pinus
[illegible] tree was about eight feet high, and
lost in [illegible] the trunk
coming right to the ice, the bark not yet
loosed but full of balsam blisters [illegible]
ever a mile from timber, [illegible]
to the deep, very blue beneath and its
no trace of Mountain above

The distribution of Abies lasiocarpa
is confined with Vaccinium scoparium
is observed upon this mountain above
but the former extends on exposed rocky
by south ridges up to the timber limit
at a height of 6400 ft., and that Vaccinium
scoparium likes places not exposed
low slate and north slopes, coming
even in sheltered cool places to the
bed of the lake. Scattered trees of Pinus
murrayana occur at a height of 6600
ft, being the Pinus Menziesii but most
[illegible] ended at 5500. Abies lasiocarpa
occasional up to 5400 ft. or
At 7300 ft Tsuga [illegible] ended, Pinus

Transcribed from notes on 7th Sept.

[illegible] extending eastward to the summit, for at 7703 on a round mass for [illegible] prae, pro- Saxifraga diversifolia, Salsola nana, Silene [illegible], Erigeron hyperboreum, and Polygonum viviparum and a little further north on a wet Lupinus micranthus and Carex brevis.

Among the stones mountain Carex pyrenaica, Juncus biglumis
Papaver radicatum
Cerastium beeringianum
Draba fladnizii
Saxifraga flagellaris
Potentilla [illegible]
[illegible]
Polygonum shastense
Saxifraga - Hirculus
Viola [illegible]
Pedicularis [illegible]
Orthocarpus pilosus
Eriophorum scheuchzeri
Artemisia alpina
Rydbergia grandiflora.
Hordeum [illegible]
[illegible] collected on Pinnacle.

The accumulation of timber in the mountain forested region would affect flow of the stream in the matter of floods as well as by way of the main surface water.

Reading at camping place on the Klamath head

At a scaling of 4700

shelf land at one time been tucked over almost to writing from Diamond Lake to and in [illegible] the headwaters of the Klamath

Diamond Lake [illegible] Sec. [illegible], Twp. [illegible], Rge. [illegible]
Wm. S.S.C. A-95

Left Diamond Lake in the morning and followed a trail across the headwaters of the Umpqua to a point on the crest of the Calapooia Mountains about two miles west of the Cascade divide.

An enormous amount of burned timber was passed through chiefly Pinus monticola.

We lost the trail at the crossing of one [illegible] of the Umpqua branches, found it again, went a mile to the head springs lost it again, and went a little too far west, above the Calapooias, where we camped at a high meadow at the south base of a rocky peak known on the maps, about two miles westward along the crest of the Calapooias from the main divide of the Cascades.

At one point we burn of large fire [illegible] Tsuga pattoniana and Abies shastensis possibly Pseudotsuga mucronata and Abies concolor with [illegible] had been refined with a dense growth of Ceanothus velutinus, and Castanopsis minor, and Lotus Nelsonii latus. It was an old burn and no young trees offered in it.

Distance about 25 miles.

Page 7??

South base Amabilis Peak Cascade Sta. 1 from
Mt. Jefferson. Alt. 6000 ft 6950.

Before breakfast made a little trip to the summit of the peak. Reading 6 7300 (A bad mistaken reading for 6800)

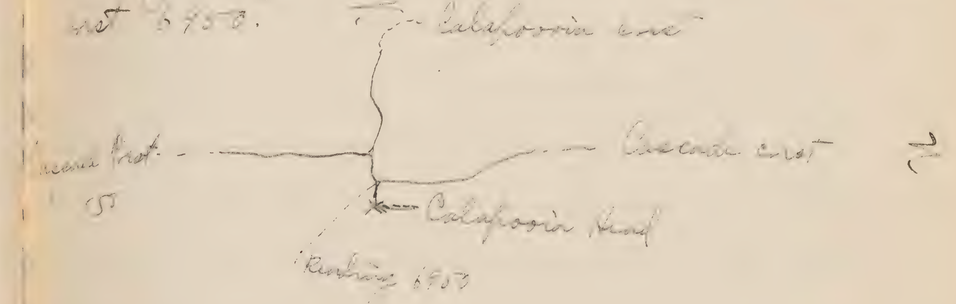
We crossed the Calapooia divide and turned northeastward toward Crescent Lake, traveling about 3 miles and camping in the morning at a little pond.

At the north base of the peak just mentioned is a clear cold little lake about ¼ mile long and half as wide from which the summit of Diamond Peak lay N. 38° west. The altitude reading was 6 5600. On account of the abundant occurrence of Abies amabilis near its eastern limit on the mountain slopes immediately about the lake and on the base of the peak we call them for convenience Amabilis Peak and Amabilis Lake

After camping made a trip on foot to the summit of the Cascade divide and along it to its junction with the California divide and to a rocky peak standing a few hundred feet east of the Cascade divide connecting with it by a short crest continuous with

Hemlock about each, only Vaccinium ovalifolium

to California birch. Pine first we meet
with on Abies Road. Reading at summit, 7200.
Reading at junction of Cascade crest with Siskiyou
crest 6750.



Measured a Pinus ponderosa at 7 ft. 2 in.
Measured an Abies Shastensis at 8 ft. 9 in.
About camp, reading 6700, trees as large
as Pinus and Abies amabilis. Scattering Pine
Pinus monticola, Abies shastensis, and Pinus
ponderosa seen near by and one Fir of Pinus
Lambertiana seen on the descent.

At a reading of 6200 and above we
Abies shastensis and A. amabilis attain. At
6100 Pinus albicaulis begins. At 6000 on an
exposed rocky south slope are a peculiar com-
bination, Pinus albicaulis, Juniperus [illegible],
Artostaphylos nevadensis, Vaccinium ovalifolium,
Ribes viscosissimum, Juniperus occidentalis, Pinus monticola
Pinus ponderosa, Juniperus occidentalis, Pinus monticola
Pinus ponderosa, Juniperus occidentalis, Pinus monticola
Pinus ponderosa

[illegible]

On the train about a quarter of an hour
a second saw a small [illegible] on
[illegible] and went [illegible] the lamp. Found
it [illegible] about [illegible] in
[illegible] in circumference started by lightning,
[illegible] wood and [illegible] from the wound
[illegible] away. A fire had started and [illegible]
an area about 200 by 50 feet measuring
[illegible] large fire [illegible] was [illegible]
[illegible], and fallen dead fire was [illegible]
20 [illegible] temperature. The leaf-cutter
[illegible] were burning, but on account of the
[illegible] of a large number of [illegible]
in various parts of Victoria [illegible]
the [illegible] slowly.

Mon. 6° [illegible] 6 5715

Summit Lake 1 5-2 20.

Camp making at noon 6 500

Summit 7 1/2 100. Snow [illegible] to melt 1 1/2 ft.

Camp about a mile [illegible] Monday, [illegible]
Left the camp for Diamond Peak today, [illegible]
on east side of Summit Lake, following the
Oregon Central Military Road about 3 [illegible], on
[illegible] timber [illegible] [illegible] at the east
foot of Diamond Peak.

To Summit Lake most of the route was through
fine Pinus murrayana forest, only one small
burn passed of ~~a few~~ saplings [illegible]
encountered. Near the swamps near the
forest was chiefly of Tsuga pattoniana with con-
siderable Abies amabilis and occasional Pinus
monticola, Pinus murrayana, and Libo-
cedrus decurrens.

From Summit Lake we passed through Pinus
murrayana for a short distance and then [illegible]
the same forest association as
that Abies shastensis. At a height of 7000
Tsuga pattoniana constituted a near forest.
To the altitude of our camp mixed Tsuga
Mertensiana and Abies lasiocarpa.

From camp in the afternoon ascended Dia-
mond, by the south east. At 7500 Tsuga pat-
toniana. Near summit Pinus albicaulis [illegible] [illegible]
[illegible] side. Several [illegible] [illegible] the

[illegible] plain 20°. [illegible]
[illegible] 2 mi; gentle [illegible]
[illegible]. Very crevassed. Forced on [illegible]

Only one bit seen from summit, about 5m
middle range of part of mountain; small. Ran
N.W. round end in that direction.

Two [illegible] mile scan 3 min.

S. side to the foot of the col 7115'. The
[illegible] slope about 21° for 400'. Small
7015 & 7115 [illegible] 1100 and 7100. 9
on the point and the point of the ice. Forced off
by the west crest, meeting the glacier. Ran Tongue
[illegible] ended at 7150, Prime altitude 5700.
On the ascent of the south slope to 6000'
[illegible] were found above Tongue Lateral.

Primus alpicola	Polygonum shastense
Pentstemon davidsonii, odor of nigunet, one fold	
Eriogonum kyndorfolium	Lupinus pectinata
Carex breweri	Arenaria fenuicola
Juncus	Eriogonum umbellatum
Antennaria pulcherrima	Saxifraga tolmiei

On coming off from the glacier met with additional:

Epilobium paludicolum	Oxyria digyna
Vaccinium scoparium	Phacelia (alpina)
Salix	Pedicularis
[illegible]	[illegible] the valley.

Ascending the east ridge met with
Eriogonum umbellatum Arenaria (alpina)
[illegible] Antennaria [illegible] Salix [illegible]
[illegible] the upper [illegible] of the ridge.

Descended the [illegible] to the valley
[illegible] by which we went.

Pinus ponderosa fragment all along.

Distance about 20 miles.

[illegible] the Big Deschutes or Big Deschutes

[illegible] = Little [illegible] = Little Deschutes

Bâgelovia bonariensis
July 23
27

August [illegible]

~~3 miles E of Penpont, [illegible]~~
~~2 miles N. of Thornhill. 1200~~

Camp on side road of Penpont (Borland). [illegible]
Tela. 2° 8 mm 1 7350.

Intersected Tela. [illegible] the stream
to the stream at 1 Bâgelovia.
Run to my stream of Tarbrax on the
Nith valley. In the morning intersected
river. Bâgelovia and
a long journey over through
[illegible] and [illegible]
wood, with undergrowth of Ribes [illegible] and
[illegible] Tibuntia. Salix erica and [illegible]
[illegible] along the Drumlie.
Bâgelovia has a different air from
the meadows we have seen, a little
[illegible] somewhat gaunt air, the [illegible]
[illegible] and [illegible] the blue Dentaria and
[illegible] the air a connect character.
Distance about 13 miles, with 2 miles [illegible]
[illegible] rate.

Interviewed J. H. Levin and E. M. Miller.

Aug. 7 1937

3½ miles [illegible] (Lower) Loup River.

Travis. Age. 37,32 & 42 & 0.

Left Big Meadows on the morning for Loup Prairie, crossing the headwaters of Big Mountain and following the Ogden road for many [illegible] Big Mountain and Fall Creek. Reached Loup Prairie about half past five, camping on the creek above Prairie. Distance [illegible]

[illegible] the whole journey through [illegible] Loup River Line, with one [illegible] and [illegible] to Tilden [illegible] and [illegible] Junction Line. This latter road [illegible] a reading of 4000 feet and over on the divide between Fall Creek and the prairie. Junction occurred again on the East Fork divide at 4500, with Ridge common.

A large flat band of Pines surrounds the [illegible] on the east and north, while [illegible] standing and 5 to 6 year old [illegible] is growing in the valley of Loup River [illegible] Loup River Junction. This is the first real [illegible]

Leaving [illegible] meeting of the headwaters, [illegible]
[illegible] was [illegible] 4700.
[illegible] after lake of Pocatello 4460, [illegible]
[illegible] than 30 feet lower.

August 11, 1902

[illegible] Marie, [illegible]
[illegible]

In the p.m. soon interviewed Simms and Miller again and went out into the mea- and watched a band of sheep. In the a.m. set out for the Sixteen mile, to ascend the Pocatello [illegible] road and ending at the north end of [illegible]
[illegible].

Almost all the timber was Pinus [illegible] at first the headwaters having for undergrowth Salix [illegible], Ribes [illegible], and Juni- perus [illegible], with a large amount of Lupinus [illegible] and considerable [illegible], Arctostaphylos, and Carex [illegible]. A few yellow pines occurred, an occasional [illegible] Abies concolor, and also a [illegible] tree Abies lasiocarpa and Picea [illegible]. The lava rocks about the lake on which we have camped bear Ceanothus [illegible], a little [illegible], considerable Arctostaphylos [illegible], one stunted Populus, and [illegible] Juniperus occidentalis.

[illegible]

August 19 1917.

[illegible] came into [illegible] of the lake [illegible],
Wind 30° E. A 7000 B 7600

Set out via the anomaly on a northerly course and after about 20 miles ~~[illegible]~~ on account of lava and mountain slope, almost all the time without a trail, and before sunset camped near a lake in the cañon between the south Sister and a ~~[illegible]~~ east of the west.

Vegetation at first like that described on yesterday's journal. At 7600 Tsuga began to come in, with an occasional Pinus monticola, and Vaccinium scoparium soon afford abundant as we ascended.

At a reading of 4950 we came upon a small lake, without surface outlet, which drains from the Three Sisters. In ascending the main slope northward from this place we came in Tsuga forests, Abies amabalis and A. lasiocarpa being frequent, the first only for a short distance. At 5700 on one slope and 5900 on another we came upon Pinus albicaulis.

For the next 2 or 3 miles we followed the trail not far from Belknap Crater around the south side [illegible] apparently an old [illegible] route to the crater.

Stock have been ~~camped~~ herded this year at the north end of the lake. From this point to our night's camp elk tracks were abundant but no sheep were seen.

On this trail we came to steep slope thoroughly obstructed by sheep, the first we have seen.

W. [illegible] 7 [illegible] miles.

Lilium ..., minimus

August 17 1892.

Camp at the west end of the South Sister, Cascade Mts., Oregon.
Max. 14.5° C. A. 6000 A 6425. No dew.
The vegetation about camp is made up of Tsuga
Mertensii, Pinus albicaulis, Sorbus occidentalis,
Pinus brewerii, Luetkea pectinata, Raillardella
argentea, Eriogonum umbellatum, Eriogonum
pyrolaefolium, Orthocarpus (Escobita w-
flowered), Pedicularis contabilis, Polygonum
newberryi, Sphaguea nivalis, Phyllodoce em-
petriformis, Agoseris barbellulatum, Eucephalus gra-
cilis, Arabis platycarpa, Pentstemon davidsonii,
and along the stream Castilleja
pallescens.

It snows o'clock in the morning started for
the summit of the rugged mountain west of
the South Sister, ascending the southernmost of the
two peaks, by way of the south crest.
At a reading of 6900 Tsuga Mertensii ended.
Above this point found the following plants
(which were collected)

Pinus albicaulis	Phyllodoce empetriformis
Pinus brewerii	Saxifraga bronchialis
Eriogonum pyrolaefolium	Arenaria
Eriogonum newberryi	Pentstemon davidsonii

Ranunculus aquatilis — Juncus [illegible]
Trifolium — Cystopteris
Alsine media — Brodiaea
Holodiscus discolor — Viola
Viola adunca — Epilobium alpinum
Stellaria crispata — Phacelia alpina
Silene — Hydrophyllum fendleri
Lupinus confertus — Collomia larsenii
Potentilla — Orthocarpus
Polemonium — Castilleja miniata
Juniperus communis — Vaccinium scoparium
Erigeron — Aletes congesta
Epilobium spicatum/alpinum — Saxifraga tolmiei
Poa

At an reading of 8200 Pinus albicaulis ended. At the summit, reading 8400, occurred Pinus, Alsine, Penstemon davidsonii and Erigeron compositus.

From the summit could be seen a forest fire, not a very large one, at the north base of the basalt. On the east side the summit is a small glacier [illegible] 1/4 mile long. Reached at 12 o'clock.

At 1:05 o'clock on the afternoon started for camp; to South Fork, according to

[illegible] and [illegible] [illegible]. Trees
at 7[illegible] Tsuga [illegible] under. Above tree line
are seen the following plants, listed in order
Pinus albicaulis Senecio [illegible]
Pentstemon davidsonii Erigeron [illegible]
Anemone Potentilla [illegible]
Castilleia Luetkea [illegible]
Lupin diffusa Vaccinium scoparium
Eriogonum hyalinifolium Pedicularis [illegible]
Festuca Juncus [illegible]
Epilobium alpinum Senecio chrysanthemifolius
Cystopteris Hutchinsia [illegible]
[illegible] Phacelia sericea
Saxifraga ferruginea Polemonium
Ivesia tetragona Eriogonum umbellatum
Phyllodoce empetriformis Poa [illegible]
Silene
Othocarpus filiosus, yellow

At a reading of 7800 Pinus albicaulis [illegible]
The summit reading 9625', is occupied by a
crater about ¼ mile in diameter, filled with snow.
The only plants along the crater rim were Poa
and a few scant tufts of Poa

From the summit were seen the [illegible] range
lines, the ocean white to the northwest, the

West we travel about 10 miles

is on the west side of the Cascade mountains. Note the snow ridge back of mountain.

After standing 45 minutes on the summit we reached camp at 6:20 P.M.

We found, particularly at [illegible], numerous [illegible] [illegible] at [illegible] at forestlines, camp roads, camping spots, and other [illegible]. It would be well to [illegible] and [illegible] for [illegible]

The cut areas should be delimited and distinctly delimited within the reserve, [illegible] as [illegible] is done in the case of timber or in the case of mining lands on a homestead claim.

The belt of Pinus murrayana was narrow, consisting only of a few specimens of Pinus [illegible], on a strong soil underlain by basaltic rock. Over all that marshy area Betula occidentalis and Populus [illegible] predominated over Kunzia

Aug - 1 [illegible]

[illegible] at the [illegible] of [illegible] Lake, [illegible], [illegible], 7 a.m. - 17°. [illegible] 7-a.m.

7 a.m. in [illegible] 27.5° C.

Set out for Sisters Pastorice by the trail. The [illegible] it runs [illegible] about 250 feet above camp. After passing the summit we traveled for about two miles through a mixed forest of Pinus ponderosa and Tsuga heterophylla.

At 5700 measured on Abies amabilis [illegible] circumference.

At an elevation of 5.00 to 5500 (reading) we many meadows, large and small, that have been closely pastured by sheep but not [illegible], nor seen, though many have been driven through. A few cattle were seen grazing chiefly on the yellow pine [illegible] in the Pinus ponderosa woods. This extended from about 5300 down to an eighth camp at 2760. Tsuga heterophylla ended at about 5500. Abies lasiocarpa went down into the Pinus ponderosa at 5200. At 4700 Kunzia tridentata came in. Sagnaw Creek 3900. Camped at Sisters Pastoffice 2760.

Made about 25 miles to-day

"Wild Carrot" [illegible] a great many stock. A plant called "stiff Lomatia" is perhaps true to a plant. It's said to come to the line to moist bed grounds, to [illegible] to [illegible] on [illegible] by the grounds.

Reading, 1 [illegible] 2850.

[illegible]

[illegible]

Dec 20 1877.

Sisters Oregon, [illegible] County, Oregon.

Min

Left the Sisters Postoffice rather late, after mailing a package of specimens by registered mail to Washington, and stopped for dinner at Indians six miles above on the Santiam road. In the afternoon moved camp eight miles, camping about seven miles among some lava rocks on Dry Creek.

Most of the days trip was through yellow pine at a reading of 3700 Abies concolor and Pseudotsuga beginning to appear. At 4000 Pinus monticola began to be abundant, but we are traveling chiefly in the valley of Dry Creek. At the same elevation also Pinus ponderosa along the Creek, Pinus edulis having appeared as far down as 3500. At our camp, reading 4200 are a few trees of Tsuga pattoni and Pinus monticola along the stream.

An important remarkage of the forest reserve is with
reference to that reserve the watering places, which
by the creation of the reserve were subject to the
local entry, cannot now be taken up.

August 2, 1899.

Camp on Dry Creek, Cook Co, Oregon.
Min. 12 a.m. ℉ 47°c ℉ 92°c.

Intermixed chaparral and ponderosa
and about camp all day. The principal
grasses on the Dry Creek range are a Bromus,
collected, "fine grass", collected, a Stipa, collected,
and Setaria viridis, besides a little small
amount of small Carices, perhaps chiefly two
hemisphaerica.

Mr. Applegate made a trip to Mt. Washington.
Mr. Reporter to Klamath at about the same
[illegible] station.

Pinus ponderosa Dougl.
Quercus chrysolepis Liebm.
Ceanothus prostratus Benth. var. intricatus
Arctostaphylos Parryana Lindl. var.
Rubus macropetalus Dougl.
Ribes sp.
Holodiscus discolor (Pursh) Maxim.
Symphoria racemosa (L.) Pers. var.
Amelanchier florida Lindl.
Prunus emarginata (Dougl.) Walp.
Rosa gymnocarpa Nutt.
Rosa sp.
Ceanothus integerrimus H. & A.
Ceanothus velutinus Dougl.
Arctostaphylos Manzanita Parry
Arctostaphylos pungens H. B. K.
Arctostaphylos sp.
Quercus Garryana Dougl.
Quercus sp.
Castanopsis chrysophylla (Dougl.) A. DC.
Pinus Lambertiana Dougl.
Abies concolor (Gord. & Glend.) Lindl.
Abies magnifica A. Murr.
Abies grandis (Dougl.) Lindl.
Abies nobilis (Dougl.) Lindl.
Abies sp.
Libocedrus decurrens Torr.
Juniperus occidentalis Hook.
Taxus brevifolia Nutt.

An Abies sericea was seen at this locality at an elevation of 2600'.

Camp on Dry Creek, Crook County, Oregon.
Aug 6th. B. 4200. A 4750. Max. temp. 91°F.
Struck out northwestward from camp crossed
the Creek, which was dry, and ascended
a ridge and followed it over the summit
of Dry Lake, down on the west slope of
the. Here meeting a thick timber, we
cut into him about four miles of the
mountain southwestward to his camp.
We were in a forest mainly of Pinus ponderosa until we had ascended
to an elevation of 5500 on the west slope, when we
came into a lava bed with a heavy
forest chiefly of Pseudotsuga mucronata with
some admixture of an Abies, either concolor or grandis. Good concolor occurred in the
upper part of the Pseudotsuga and in the lower part of the yellow Pinus ponderosa. The most of
the lava rock was in place as lava
flows, with vesicular, Cellular mineral, and
brecciated structure.
At the elevation of Fish Lake, reading about 5400 ft
above sea level, Pinus contorta, Pinus ponderosa and
Abies concolor appear.

As we drive [illegible] the [illegible]
[illegible] we come [illegible] a [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] seen before. It is well [illegible]
that our night's camping place [illegible]
may be characterized briefly as follows.

Trees Abies nobilis
Abies amabilis
Tsuga mertensiana
Pinus monticola.

Shrubs, Acer circinatum — Rubus Lasiococcus
Echinopanax horridum — Ribes lacustre
Sambucus racemosa — Rhododendron
Ribes Sudsonianum — Rosa
Rubus spectabilis
Vaccinium membranaceum
Rubus vitifolius
Rubus leucodermis.

Herbaceous plants. Aconitum columbianum — Actaea Arguta
Achlys triphylla — Mertensia
Chimaphila umbellata — Orchis
Mitella — Epilobium
Disporum — Pyrola rotundifolia
Streptopus — Smilacina
Pteris aquilina — Adenocaulon

August 21, 1897

camp on Beaver Ridge, Lime & Beaver
Mtns. 16 miles C. E 3700 A. 4650.

Returned down Thorn, Anderson and
soon after set out to take a look at the Bear
or Ridge range with Mr Thorn.

The heavy forest began splendid [illegible]
[illegible] the rocky open slopes began, chiefly
the forest in middle slope of Range [illegible]
Pinus ponderosa scopulorum, Abies [illegible]
Picea engelmanni, and an occasional [illegible]
menziesii and Pinus monticola. Camp
at two high points on the crest 9900 and 10000
One Pinus monticola, near the [illegible]
[illegible] 5 ft. 4 in. circumference.
This monticola at camp 10 ft. 5 in.
Picea engelmanni " " 8 ft. 1 in.
" " 9 ft. 10 in.
Traveled on foot about 7 miles.

Aug. 2 (??)

Camp on Round Ridge, Klam. County, Oregon.
Min. 10°C. A 3150 R. 4725. Max. temp. 24°C.
Moved camp from Crescent Lake to Fish Lake. Interviewed Mr. Kaylor and Pierce.
Distance 7 miles.

Aug 25, (??)

Fish Lake, Linn County, Oregon
Min. (25°C). A 2550 R 3570.
Left camp at Fish Lake in the morning and followed the road east to Hamilton, 24 miles. On the summit, about a mile east of Big Lake, N. Allegate, with a saddle horse, one pack-horse, and outfit, left us to pack-trip back into the Mt. Jefferson, to meet us August 31 at Detroit Bridge.
At the toll gate interviewed Mr. Bostic and left Lawrence. In the afternoon crossed Santiam summit and camped.
Altitude making at the toll gate House

Aug. 21, (1)

Distance made, Cross R. ...

7 — 25° F 2842. R 2871.

Left Kingman by way of Hualapai Pass ...

Between Kingman and Hualapai Pass ...

...

Distance 23 miles.

Aug 21, 1871.

Tetheron Bridge / Beaudette Ranch / Camp Date ...

... 2 2242 F 3110.

Left Tetheron Bridge for Prescott, 20 miles. Crossing ...

... Tetheron Bridge ...

Aug 21 — Mr Tetheron (left)

Sept 28

2000 to 2200.

Proceeded South [illegible]
to Peninsula on the Lake, thence [illegible]
[illegible] road, I over a road [illegible]
Lying with the Mountain. Pitch
[illegible] at Richard [illegible] Spur of
the Mountains.

At 2000 feet we crossed the Extension of
Timber Cretaceous, on the top of the
Summit of the Spur 4300 feet. Found [illegible]
[illegible] on north summit at 4300 feet.

Soil on the south side of the spur [illegible]
[illegible] accumulations of the [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]

Distance 2 miles.

Nov. 26 [illegible] 1873.

Set out for Mr. Roper's ranch on Hay Creek, traveling down Hay Creek, up Trout Creek, up Coo Canyon and across to Mr. Roper's.

At 1500 reading on the alkaline water of Coo Creek near Lecontites vermiculatus in stone house.

Lowest reading on Hay Creek 1400.

Lower end of Coo Canyon, reading 1800, summit of the road as it leaves the canyon 2900, summit of the plateau at different points 2500 and 3000.

Pinus divaricata seen abundantly in Canyon but not collected.

In the canyons were a variety of trees and shrubs, but the plateau was devoid of trees, bearing ~~occasional~~ a native grass covering of Bouteloua Douglasii and B. gracilens, with frequent areas of Artemisia nigida, but rarely a bunch of A. tridentata.

Distance about 32 miles.

Aug. 30 1872

Encamped near, on Red Lava, Mason Valley.
Wm 82°C. 19.2630 A. 1675.
Traveled to-day by way of Belcher's
Bear Bridge, over much the same country
as yesterday. Distance 30 miles.

Aug. 31 1872.

Bear Bridge, Mason Valley.
A. 5412
Made a short trip of seven miles out to
Mr Sonny's ranch in Topa Valley and
camped for the day.
Mr. Applegate came in at noon from
his Mt. Jefferson trip, having traveled from
the Canadian road to Mt. Jack, to the head
of Jefferson, down the Metolius to the
Warm Springs agency and thence by
the wagon road to Topa Valley.
Measured a specimen of Prunus demissa
with a trunk 21½ inches in circumference.
Scattered pines (Pinus ponderosa) in the vicinity
of Topa this morning, except for which
ranging in open in the valley.

Tyee Valley 1087 feet according to Wheeler Survey.

Sept. 10th.

Bonney's ranch, Tyee Valley, Wheeler Survey. Min 32°C A. 80°.

Traveled from Tyee Valley to Wanic and up the Barlow road to or as White River.

Summit of Wanic Plateau 2 P.M.

Timber began on the slopes, at the Plateau & Wanic is chiefly over ten feet high, with openings, which near at a reading of 1900 on the Barlow Road.

Forest to about 3900 of P. ponderosa with Abies nobilis, Pseudotsuga, and Pinus monticola changed a majority of Pinus ponderosa and on Boulder Creek Abies grandis is in. And bunch decidedly that of the west slope, Calocedrus decurrens coming well down in the valleys. Cornus nuttallii ~~appears~~ 4 to 4 in. diameter. Rhamnus purshiana and Corylus rostrata ~~in~~ ~~common~~ Fencing at Boulder Creek 2650.

Distance about 25 miles.

[illegible] F. C. L. 1211.

Started [illegible] on the Palouse road [illegible]
[illegible] on for a Mean of 16 miles.
The first natural glade in the Palouse [illegible]
at a reading of 1000 feet.

Sept. [illegible]

Wamic, Wasco county, Oregon.
Took the road to Dufur, on the [illegible] River
The Dalles, and camped there, 15 miles.
Passed through no forest on the way. The
[illegible] of the road over the [illegible]
[illegible] Top Hills was 2200 feet.

Sept. 6, 1897.

Dufur, Wasco Co., Oregon.
To-day went from Dufur to the Dalles, 15 miles.

Sept. 7, 1897.

Remained at the Dalles.

Sept. 8, 1897.

Went to Portland by boat, and there, on Sept. 9
finished the season's work.

Ashland, Ore. July 11, 1902.

Reached Ashland about noon, by rail from Portland, and proceeded to negotiate for transportation to Klamath Agency.

In the neighborhood of Ashland the following trees and shrubs were seen.

Quercus garryana
" californica
Rhus obtusiloba
Berberis aquifolium, scarce below the pine
Amelanchier pallida
Rhus trilobata
Ribes klamathense
Cornus
Fraxinus
Rosa
Prunus demissa
Philadelphus
Rubus vitifolius
" leucodermis
Salix lyallii
" of the fluviatilis group
"

Vitis californica
Clematis ligusticifolia
Phoradendron villosum on the oaks.
Sambucus caerulea
Ribes bracteosum, only one seen.

Acer macrophyllum
Cornus Nuttallii
Corylus rostrata
Ceanothus divaricatus
" integerrimus
Pirus trichocarpa, not abundant.
Arctostaphylos
Abies menziesii

Of the above plants those underscored with a straight line are characteristic and abundant species of the upland foothill and valley flora, those underscored with a wavy line are characteristic of the watercourses of the same flora.

Ashland, Oreg. July 2, 902.
Finally succeeded in securing
transportation for tomorrow by the
Dead Indian road.

Passed over the Ashland-Buck Lake divide

Pseudotsuga mucronata

Berberis aquifolium also characteristic

Lindsey's (selling) ranch, Co., Ore.
July 3, 1902.

Distance traveled 2, miles.

Left Ashland at 8:20 A.M. and reached this place, mile west of Hunts ranch, at about 5 P.M., stopping 1/2 hour for lunch.

The yellow pine belt begins on southerly slopes, at an estimated elevation of 3500 feet. The following trees and shrubs, additional to those recorded for July 1 were observed to-day.

Pinus ponderosa
Abies concolor
Libocedrus decurrens
Pinus lambertiana
Osmaronia cerasiformis, only in leaf.
Ribes sanguineum
Ceanothus sanguineus
Acer glabrum
Pachystima myrsinites
Cornus occidentalis
Berberis nervosa
Amelanchier, taller leaves more toothed than publifolia

Symphoricarpos
Populus tremuloides, in spots.
Prunus subcordata.
" mollis
Holodiscus discolius
Viburnum
Cercocarpus betuloides
Spiraea
Sorbus sambucifolia
Rupus parviflia
Salix scouleriana
" lyeriana.
Ribes sericeum
Lonicera conjugialis
" involucrata
Ceanothus velutinus, in bens
" prostratus
Chrysothamnus graveolens, near lin
Castanopsis orthacantha
Rosa nutkana (probably pyrnocarpa)
" engelmannii
" pinetorum
Ribes binominatum
" lobbii
" lacustre

Those underscored with a straight line are characteristic of the red fir forest, those with a wavy line of the yellow pine forest, there two kinds of variety representing the moist and the dry phase of the same forest zone.

West of the first half of the day's ride was spent in the Buck Lake basin. About noon we crossed the Buck Lake — Lake of the Woods divide.

Pelican Bay, Klamath Co, Ore., July 17, 1902.

Distance traveled 31 miles.

Left Lindsey's at 7:30 A.M., reaching this place at about 7:00 P.M. Stopped an hour for lunch at a creek about a mile southwest of Lake of the Woods.

Saw the following new shrubs and trees to-day:

Rhamnus purshiana, only one witnessed
Pinus contorta
" monticola
Abies shastensis
Picea engelmanni
Tsuga mertensiana
Ribes irriguum
" sapoxum
Vaccinium membranaceum.
" scoparium, one shrub
Alnus tenuifolia.
~~Betula glandulosa~~.
Kunzia tridentata.
Viburnum lanciflorum
Corylus californica
Salix sitchensis.
Gaultheria ovatifolia

Lonicera ciliosa
? Rosa diffusa
Vaccinium occidentale
.. serratulum

Rose underscored with a straight line appear to be the outline of a zone above that of the red fir:

Klamath Agency, Oregon, July 15, 1902.
Distance travelled 25 miles
Left Pelican Bay at 8.00 A.M., stopped
two hours for lunch at Cherry Creek,
and reached the Agency about 7:00
P.M.
Nero shot to-day
Betula glandulosa.

Klamath Agency Oregon July 16, 1902.
Remained at the Agency to-day,
writing notes.
Found new to-day
Ribes sapoeum

Klamath Agency, Oregon, July 17, 1902.
Remained at the Agency to-day, writing
notes.

Klamath Agency, Oregon, July 18, 1902.
Drove to-day with Abraham Charles from the Agency to Williamson River bridge and up the river to Chiloquin Bridge, thence back to the Agency. Secured considerable information from Abraham about the uses of plants. Below Chiloquin Bridge called on old man Johnson.
Distance traveled, including a drive to the head of the newly constructing irrigating ditch, 18 miles.

Klamath Agency, Oregon, July 19, 1902.
Drove to-day with Abraham Charles to Williamson River bridge, Chiloquin Bridge, and back to the Agency. Most of the time was spent with Ellen and Nimrod about half way from the Agency to the Williamson River bridge.
Distance traveled 16 miles.

Klamath Agency, Oregon, July 20, 1902.
Sunday. Remained at the Agency.

Klamath Agency, Oregon, July 21, 1902.
Remained at the Agency writing notes and settling accounts. Walpole arrived.

Klamath Agency, Oregon, July 22, 1902.
Drove with Walpole to Cunningham's ranch above Fort Klamath, and arranged with Cunningham to make a trip to Klamath Marsh beginning June 28, 1902.

Klamath Agency, Oregon, July 23, 1902.
Drove ~~with~~ Abraham to Williamson River again, spending about half the day at Ellen's and Nimrod's and half at Ben Wright's.
Distance traveled 17 miles.

Klamath Agency, Oregon, July ~~24~~ 25, 1902.
Remained at the Agency writing notes.

Klamath Agency, Oregon, July 24, 1902.
Drove to Spring Creek, returning by way of ~~Rocky~~ Stony Ford.
Distance traveled 14 miles

Klamath Agency, Oregon, July 26 1902.
Rode to Chiloquin Bridge, and then with Abram Charles went on down Williamson River, and rode as far south as Joe Wakes place. Interviewed three or four families and returned direct to the Agency.
Distance traveled 24 miles.

Klamath Agency, Oregon, July 27, 1902.
Sunday. In the afternoon drove with Mr. Applegate and Miss Norman to old Fort Klamath at the head of Fort Creek. Found it inaccessible on account of logs to drive all the way to the head of Wood River.

Route of A. H. Engle, Klamath County Ore.
July 28, 1902.
Left the Agency at 2 P. M. with Burton Cunningham, and rodad—this place, at southern end of Klamath Marsh.
Rode through yellow pine with lodgepole pine on the flats, and some white and red fir on north slopes.
Distance 14 miles.

Nome Bay, Klamath Marsh, July 29, 1902.
Meadow border 13 miles.

Proceeding around the margin of the marsh from Eagle to Nute Bays meet the Nome Bay. Flat ponds in forest with Sedgefole Pine, with occasional Arctostaphylos in low areas. uva-ursi. Vaccinium scoparium, and Spiraea, in higher areas Ribes lacustre and Ranunculus trichophyllus.

The succession of vegetation from forest to meadow about the marsh varies. At Eagle Bay the succession is sedgefole Pine to grass dominat. On the opposite side of the marsh the succession is Pinus ponderosa, Populus tremuloides, Salix yezoensis, meadow. In general along our route the succession has been Sedgefole Pine, Salix yezoensis, meadow. In crossing one arm of the marsh we passed through a large area, hundreds of acres, of pumice tuff. The meadow shows evidence of occasional bogness, with plants as Nelumbium and Menthra having very little growth.

Otis camp.
~~Klamath~~ Klamath Marsh, July 30, 1902
Distance traveled about 4 miles
Came around the margin of the marsh to Otis camp starting about 4 o'clock P.M.
No water here. High ground all the way, broadly, down to the meadow.

Billy Balls marsh, Klamath Marsh, Ore. July 31/02
Distance traveled about 23 miles.
Left Otis camp after dinner, traveled fast and reached Billy Balls place. Traveled around the edge of Wakeva Bay. High yellow pine ground coming down to the meadow or the marsh nearly all the way. No extensive lodgepole pine flats. No sagebrush seen along the whole march till we reached Billy Balls. Thousands of acres of wheat seen during the day.

Garfield Jacks ranch, Klamath Marsh, Aug. 1, 1902.

Left Billy Ball's ranch this morning and came around the head of the marsh through ~~Lis~~ Siemens field and down the west side of the marsh to this place. The last ten or twelve miles are through a flat, mostly boy, of lodgepole pine. The characteristic undergrowth of these areas is Purshia tridentata, Chrysothamnus bloomeri, and Ribes cereum. The meadows and pastures on this side of the marsh to this point separate the timber by a distance often of three miles from the channel of the river. At one point, below Linse's place, was probably a thousand acres covered with low shrubs of Salix geyeriana. Antelope tracks were seen here.

Distance traveled about 35 miles.

Klamath Agency, Oregon, August 2, 1902.

Left Garfield Jacks ranch and came down the old road along the edge of the marsh, letting down fences. Visited Simon Isaacs camp. Lunched opposite Engles. Reached the agency befor night.

Distance traveled about 24 miles.

Klamath Agency, Ore. August 3, 1902.
Sunday. Remained at the Agency.

Klamath Agency, Ore., August 4, 1902.
Remained at the Agency, writing notes

Klamath Agency, Ore., August 5, 1902
Remained at the Agency writing notes.

Klamath Agency Ore., Aug 6, 1902.
Remained at the Agency, writing notes.

Klamath Agency, Oregon, Aug. 7, 1902.
Drove with Abraham Charles to Joe Weeks, near Modoc Point and return. Stopped on the way at Allie Tecumseh's and at J. H. Palmer's, and at Ida Morgan's. Had interviews with all these except the last who was not at home.
Distance traveled 23 miles

Klamath Agency, Ore. Aug 8, 1902.
Drove with Stanley to Joe Weeks, and visited the Modoc Point bluff and the tule border of the lake opposite. Returned to the Agency.
Distance traveled 25 miles.

Klamath Agency, Org., August 9, 1902.
Saturday. Remained at the Agency. In the afternoon interviewed some of the old Indians through Frank Howe.

Klamath Agency, Org., August 10, 1902.
Sunday. Remained at the Agency.

Klamath Agency, Org., August 10, 1902.
Remained at the Agency, writing up accounts.

Klamath Agency, Oregon, August 12, 1902
Left the Agency in the morning for Crater Lake, with Captain Applegates party. Camped in the rain at Anna Creek Spring. Party included Representative Longuid and Mr. Arant the newly selected superintendent of the Crater Lake National Park. Distance 25 miles

Crater Lake, Org., August 13 1902.
Camped early at ~~the~~ Captain Applegates old camping ground ~~of the~~ at the rim of the Lake. Mr. Steele's party were camped at the old Mazama camping ground. Rained nearly all day. Distance 4 miles.

Crater Lake, Oregon, August 14, 1902.
Rained nearly all day. Visited the spring below camp and Mr. Waldo's camp.

Klamath Agency, Oregon, August 15, 1902.
Returned from Crater Lake to the Agency, descending to the falls in Annie Creek on the way down. Found there the following within the limits of the park
Picea engelmanni
Kunzia tridentata.
Distance traveled 29 miles.

Klamath Agency, Oregon, August 16, 1902.
Drove with the members of Mr. Steel's party and Captain Applegate to Spring Creek and Chiloquin Bridge. On the return visited Johnson, the old Indian below Chiloquin Bridge
In the evening made a short address in the Reservation school building on the botany of the region.
Distance traveled about 10 miles.

Klamath Agency, Or. August 17, 1902.
Sunday. Remained at the Agency, in the afternoon ascending Agency Mountain

Joe Meeks ranch, near Modoc Point, Or., August 18, 1902.
Remained at the Agency during the day, and drove down to this place in the evening. Distance 11 miles

Klamath Agency, Oregon, August 19, 1902.
Returned to the Agency in the morning Joe Meeks not having returned.
In the afternoon went to the head springs of Wood River and returned by way of Fort Klamath post office.
Distance about 30 miles.

Klamath Agency, Oregon, August 20th, 1902.
Remained at the Agency.

[Aug. 21, 1902.

Yainax, Klamath Indian Reservation, Ore.,
Drove over to this place from the Agency with Captain Applegate.
Distance traveled 40 miles.

Yainax, Klamath Indian Reservation, Ore, [1902 Aug 22,
Drove with Mr. George Loosley to the head of Yainax valley, visiting various Indian families.
Distance traveled 35 miles.

Yainax, Klamath Indian Reservation, Ore., Aug. 23, 1902.
Drove with Robin Hood, Modoc Indian, to the Piute camp near the mouth of Sycan Creek, across the bridge over Sprague River at the head of Yainax valley, around Whiskey Creek valley, and back to ~~the Agency~~. Yainax, visiting several Modoc and Piute families.
Distance traveled 35 miles.

2.

Harrison Brown's, Yainax Indian Reservation, Aug. 24, 1902.

Drove with Robin Hood from Yainax to the head of ~~Sprague Rver~~ Yainax valley and on up Sprague River to Modoc Henry's, then back to Yainax and ~~down~~ up again to Harrison Brown's.

Distance traveled 40 miles.

Yainax, Klamath Indian Reservation, Ore. Aug. 25, 1902.

Rode with Harrison Brown to the summit of Yainax Mountain (Baldy or as the Indians call it, Walpi), and back to Harrison Brown's ranch. Then drove with him to Yainax.

Distance traveled 32 miles.

Klamath Agency, Ore., Aug. 26, 1902.

Drove from Yainax to the Agency with Mr. and Mrs Frederick Snyder. Distance 40 miles.

Klamath Agency, Ore., August 27, 1902.

Remained at the Agency.

Joe Meek's, Klamath Indian Reservation, Oreg. Aug. 25, 1902.

Remained at the Agency in the forenoon. Met Mr. W. C. Cusick, who was on his way from the region of Waldo, southern Oregon, back to his home in the Blue Mountains.

In the afternoon drove to Joe Meek's ranch.

Distance traveled 11 miles.

Joe Meek's, Klamath Indian Reservation, Oreg. Aug. 29, 1902.

In the forenoon drove to Modoc Point. In the afternoon made a trip by boat up the shore of the lake toward the mouth of Williamson River and returned to Joe Meek's. Distance 10 miles.

Klamath Agency, Oregon, August 30, 1902.

~~Paddled~~ Rowed across the lake to Bare Island and returned to Joe Meek's. In the afternoon drove to the Agency.

Distance 22 miles.

1902.

Klamath Agency, Org., August 31, Sunday. Remained at the Agency.

Klamath Agency, Org., Sept. 1, 1902.
Remained at the Agency. Late in the afternoon drove to Fort Klamath and return.

Klamath Agency, Org., Sept. 2, 1902.
Remained at the Agency, getting ready to move.

Near Anna Creek Falls, Org. Sept. 3, 1902.
Left the agency in the morning and camped at this spot, on the Crater Lake road, on the top of the canyon, at a point about three-quarters of a mile above the falls. Made a trip down into the canyon and back.

Anna Creek Spring, Org., Sept. 4, 1902. 2.
Made a trip down into the canyon. Moved camp up to this point late in the forenoon. 2.
In the afternoon rode from camp eastward and northward around the mountains to Cathedral Spring, the rim of the crater, and back to camp by the road.

Red Blanket Creek, Crater Lake National Park, Oreg., Sept. 5, 1902.
Came to-day from Anna Creek Spring down the road to Pole Bridge Creek, then up the latter, and south along the west side of the main divide to this point, almost due south of Union Peak. Shasta fir and black hemlock forests with many natural glades all the way from the Pole Bridge fork. Large burn apparently about 12 years old along the north side of Red Blanket Creek.

Red Blanket Creek, Crater Lake National Park, Oreg., Sept 6, 1902
Went to the summit of Union Peak to-day and returned to camp.

Huckleberry Mountain Oreg., Sept. 7, 1902
Came to this place, at the uppermost spring of the old Indian camping ground to-day. Went north and a little west from camp and struck the old Indian trail southwest from Union Peak. Followed the trail to this point.

Huckleberry Mountain, Orig., Sept. 8, 1902.
Remained at camp during the most of day, waiting
Little John's camp in the evening

Huckleberry Mountain, Orig., Sept. 9, 1902.
Worked with Little John about the meadow
in the forenoon, and in the afternoon rode down
with him to Union Creek and the Rogue River — Fort Klamath
road and return. In the evening visited Indian
camps.

Huckleberry Mountain. Orig. Sept 10, 1902.
Rode with Joe Wilcox southwestward along the
mountain. In the evening visited Indian camps.

Crater Lake, Oregon, Sept. 11, 1902.
Came from Huckleberry Mountain to this place
by the trail and the Rogue River road. In
the afternoon went down to Cathedral Spring
and collected some plants. Captain Applegates party arrived.

Crater Lake, Oregon, Sept. 12, 1902.
In the forenoon visited Cathedral Spring again, then went down the trail to the lake and walked along the shore westward. In the afternoon walked along the shore eastward.

Sept. 13/1902
Camp one mile north of Glacier Peak, Crater Lake, Ore.
Came to this point to-day, taking Mr. Merchberger's new trail between the Watchman and the lake. Camped by a snow meadow and dug for water

Camp at Anderson Spring, Crater Lake, Ore., Sept 14, 1902
Came to this point to-day around the rim of the lake, visiting Llao Rock and collecting at various points along the rim.

Camp at Anderson Spring, Crater Lake, Ore. Sept. 15, 1902.
Climbed Mount Scott by southeast ridge, descended northwest ridge and came around southwest ridge back to camp.

Mr. S. K. Ogle informs me that he has found the black raspberry (Rubus leucodermis) on the rocky ridge to the south of the road at a point west of Anna Creek Falls.

Klamath Agency, Oregon, Sept. 14, 1902.
Came to this point to-day, going from Anderson Spring across both forks of Sand Creek, then climbing around the southeast end of Deutton Cliff to Sun Creek canyon, below the falls, and descending the latter.

Klamath Agency, Oregon, Sept. 17, 1902.
Remained at the Agency to-day.

Klamath Agency, Org., Sept. 18, 1902.
Remained at the Agency

Klamath Agency, Orgn., Sept. 19, 1902.
Remained at the Agency.

Klamath Agency, Org., Sept. 20, 1902.
Remained at the Agency.

Klamath Agency, Org., Sept. 21, 1902.
Sunday. Remained at the Agency.

Klamath Falls, Ore., Sept. 22, 1902.
Drove from the Agency to-day by the stage route.
Distance traveled 32 miles.

Klamath Hot Springs, Cal. Sept. 23, 1902.
Drove from Klamath Falls to-day.
Distance traveled

Ager, California, Sept. 24, 1902.
Drove from Klamath Hot Springs to this place this forenoon, and take the train north about noon.
Distance traveled.

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